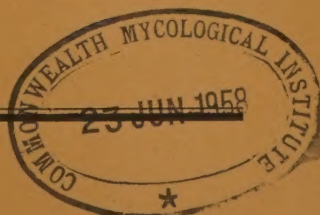
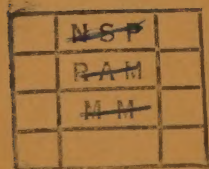




TANGANYIKA

Annual Report  
of the  
Department of Agriculture  
1957  
PART I

1958  
PRINTED BY THE GOVERNMENT PRINTER  
DAR ES SALAAM  
Price Shs. 4/50





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**PART I**





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## TANGANYIKA

# ANNUAL REPORT OF THE DEPARTMENT OF AGRICULTURE, 1957

## Part I

### SECTION I

#### INTRODUCTION

Nineteen fifty-seven can be regarded as a year of substantial progress in nearly every aspect of the Department's work. The main lines of policy remained unchanged except that a decision was reached to transfer responsibility for pasture research and extension work to the Department as from July, 1958.

On the extension side the transition from forceful methods backed by rules and regulations to persuasion and the gaining of confidence made great progress in a number of districts, and the improvement in the relationships between the farmer and the field advisory staff as the clouds of suspicion are slowly dispelled is most encouraging. There still remain several important areas, however, where either resentment, apathy or immature political ideas prevent the population from taking advantage of the services which are available to them. The results from the focal point approach are proving beyond doubt the psychological soundness of this method, particularly in parts of the Eastern and Western Provinces. The posting of an advisory officer specifically to the larger farms and estates in the Northern Province was an unqualified success.

The publicity section was considerably developed. Great strides were made in the evolution of broadcasting technique, and regular programmes were prepared for the vernacular programmes. This medium can be very effective because to unsophisticated ears the voice from Dar es Salaam carries authority, and the fact that many local farmers are apparently even known by name establishes confidence. A regular stream of material was provided for the Public Relations Department, and continual references to our work were made in the vernacular press.

At the instigation of the African Members of Legislative Council the whole field of improving the productivity of land and labour was reviewed; first at District level, then by Provincial Teams and finally by Central Government. Plans were divided into three categories, viz.:—those which could be implemented by redeployment of existing staff and funds; those which merely required additional Native Authority assistance, and finally those which needed additional staff and finance. Work on schemes in the first two categories was started almost immediately, and in early November a comprehensive plan involving twenty-nine selected schemes was submitted to the Secretary of State with a request for C.D. and W. assistance amounting to £206,611.

On the research side progress in establishing the Regional Centres was necessarily slow owing to the extent of the building programmes and recruiting difficulties. A new farm was taken over from the Tanganyika Agricultural Corporation at Nachingwea and the old experimental farm at Urambo became part of the Western Regional organisation. The highlights of the year's work were some positive results on the benefits of intercropping; the launching of a comprehensive attack on the breeding, agronomy and pests of castor; and the excellent responses obtained from fertilisers at Mwanhala. The meetings of the Inter-Territorial Research Co-ordinating Committees in December were of great value, and proved that a highly efficient framework for planning research in East Africa is now well past the evolutionary stage.



The formation of land use planning units was hampered by inability to recruit soil chemists, but two Planning Officers operated throughout the year with the assistance of the Government Chemist and a Survey Section was established at Morogoro. The Soil Conservation Mechanical Units continued to render valuable service to progressive farmers; in particular the unit centred on Iringa had a most successful year, and earned the full approbation of the farming community.

Investigations into actual and projected irrigation schemes showed that in many areas problems of soil alkalinity and salinity often underlie superficially promising topography, and in one particular case salinity developed in stored dam water. It is felt that attention should first be given to developing schemes where soil fertility is unquestioned, leaving the problem areas to a later stage. The three pilot areas under the Rufiji Basin Survey organisation all provided valuable results on which to base further development.

On the animal husbandry side all herds kept on departmental farms and stations were thoroughly reviewed, and were replanned to fit in with an agreed territorial breeding policy. This was an important step forward from the previous policy on many stations of merely maintaining a herd of "muck-makers".

Another phase was reached in the evolution of farm mechanisation in African areas. Apart from planned settlement schemes under managing agents, the concept of government sponsored contract services has now been completely abandoned, and attention is being directed towards providing technical advisory services in areas where there are appreciable numbers of individually or co-operatively owned tractors. These services embrace advice on maintenance and implement setting, assistance in effecting minor repairs, the running of short training courses and encouragement in the keeping of simple cost accounts.

No major settlement schemes for developing new land were started during the year, but very good progress was made in continuing to open up the new large farms in the Babati area of the Northern Province, and plans for a tenant farming project at Kisaki in the Eastern Province reached an advanced stage. Great interest was shown by several tea planting companies in finding land for new development, but ideal conditions for this crop are scarce.

The Wami Farm School had a difficult year. Living conditions are far from ideal, the staff need more guidance in teaching method and the students need to show much more enthusiasm for learning the dirtier jobs by doing them. Some advances were made in implementing the new plan for school farms and gardens, and special mention must be made of achievements in Tanga Province. It will take time for the teachers even those who have been specially trained, to adjust themselves to the spirit and practice of the new ideas.

The threat of *Trogoderma granarium* becoming established in the territory by means of infested imports was intensified, and it became necessary to insist on the fumigation of all suspect cargoes. Restrictions on the importation of plants and soil from the other three East African territories were abolished; although there is some danger of the spread of pests and diseases, it is quite impossible to enforce regulations over open frontiers.

The year was free from locust plagues, but we enter 1958 with a threat of invasion by desert locusts from the north.

## SECTION II

### GENERAL REVIEW OF THE CROP SEASON

In general the rainfall throughout the Territory in 1957 was normal and reasonably well distributed for crop production. Isolated areas here and there suffered mild drought conditions and there were cases of loss of crop due to flooding, but throughout most of the Territory cropping conditions were good and total production was well maintained. Cotton production in the Lake Province again went up to a new record and there was a substantial increase in mild coffee. Sisal showed a slight decline, due partly to the unattractive price and partly to the effects of drought in the latter part of 1956.



In the Lake Province the rain was favourable to food crops but was rather too heavy for cotton in the areas near the lake shore. In the drier parts towards the south and east, however, conditions for this crop were ideal and at Maswa, Shinyanga, Kwimba and south Geita the best cotton crop was harvested that has ever been recorded. The heavy rains near the lake shore caused some difficulty in drying coffee in Bukoba and this was partly the reason for a deterioration in the quality of coffee from that area. A heavy attack of Coffee Berry Borer also severely affected both quantity and quality.

In the Rufiji a late flood in mid-May caused an estimated loss of 25 to 30 per cent of the maturing paddy crop. The economic loss, however, was to some extent made up by late-planted cotton. Excellent short rains in this area at the end of the year have given rise to hopeful expectations for 1958, but severely curtailed the ploughing season.

In the Southern Highlands seasonal totals of rain were high in Iringa, Chunya and Mbosi, and heavy storms on the lake shore area of Tukuyu did some damage. The dry season in that Province, however, has been somewhat more severe than usual and perennial crops such as tea and coffee have suffered in consequence.

In the Northern Province rainfall was adequate in quantity but was not well distributed. The bean crop in particular suffered very severely from too continuous rain and seed bean production was lower than for many years. Good short rains induced a heavy flowering of coffee towards the end of the year and prospects for the 1957/58 crop are excellent.

Tanga Province was the one area where the long rains crops were decidedly poor due to a late start and an early finish to the SE. Monsoon rains. On the other hand those areas in the province which depend on the "short rains" of the NE. Monsoon enjoyed an excellent season (1956/57) and the surplus from this crop alleviated any danger of food shortage which might have otherwise occurred with the failure of the long rain crops.

Rainfall figures for the 1956/57 season at representative stations are given at Appendix I.

### SECTION III

#### MARKETING AND GRADING OF PRODUCE

##### *Foodstuffs*

The last control over the purchase of any type of foodstuff was removed when wheat was decontrolled in December and the Produce Control Ordinance abolished. The support price for maize which Government had undertaken to offer for a final year was reduced to Shs. 25/- per bag at port. Production of maize was adequate for local consumption and in the face of a declining world price local prices tended to drift downwards, varying according to locality from Shs. 18/- to Shs. 35/- a bag.

As mentioned in last year's Report, the system of marketing produce through Native Authority markets is tending to break down in many areas, partly because of the desire of the producer to avoid the cesses and duties imposed on produce sold through these markets, and partly because, with the development of communications and lorry transport, buyers are far more prepared to go out and buy produce on the producer's doorstep: the development of co-operatives is a further factor. One result of this tendency is that official records and estimates of production, particularly of foodstuffs, are tending to become less accurate.

##### *Cotton*

The price of Grade 1 seed cotton was reduced from 57 cents to 54 cents a pound in the Lake Province, and from 125 cents to 120 cents per kilo in other parts of the Territory. Apart from this slight reduction—which did not affect interest in the crop—marketing conditions remained unchanged.

The number of cotton marketing co-operatives in the Lake Province increased from 199 to 237, and they handled 70 per cent of the total crop which is estimated to amount to a record total of 82,250 tons of seed cotton, equivalent to 150,000 bales of lint. The marketing

of this huge crop was not without difficulties and certain ginneries with neither the capacity nor the organisation to handle an increased crop were rather overwhelmed, but no major breakdowns occurred. The main bottlenecks are bagging at co-operative centres and unbagging at the ginneries; investigations on the bulk handling of seed cotton continued and new methods are to be given limited trials on a zonal basis next season. Picking was delayed on many holdings and part of the crop, estimated at about 5,000 bales, was eventually abandoned by the growers. This late-picked cotton also tended to show a grey tinge which will detract from the attractiveness of the lint.

A permit to erect a second ginnery was issued to the Victoria Federation of Co-operative Unions, Ltd.

### *Coffee*

There were no changes in the arrangements for the marketing of coffee. All wet processed (mild) Arabica produced by African growers was sold by their Co-operatives at the Moshi auctions. The European-produced Arabica crop was largely sold by the Tanganyika Coffee Growers' Association who placed some parcels on the Nairobi auctions and also made direct sales, some of which were in parchment. The Bukoba Robusta and dry processed Arabica (hard coffee) was sold by the Co-operative Union on the Mombasa auction floor.

### *Tobacco*

Production of flue-cured tobacco in the Southern Highlands is regulated by the Board set up under the Tobacco Ordinance of 1951. Ninety-one licences to grow tobacco were issued in the 1956/57 season, covering 6,246 acres of which an estimated 4,216 acres were planted to Virginia tobacco and the balance to Ehlers. This crop is packed and sold by the Southern Highlands Tobacco Growers' Union. The Western Province flue-cured crop was sold direct to the East African Tobacco Company.

The Nyamirembe Native Tobacco Board handles the fire-cured crop produced in the Kibondo District of the Western Province and in the Ngara and Biharamulo Districts of the Lake Province. There was an increase in the amount of leaf delivered to the Board from Kibondo, but the quantity from the Lake Province diminished and in all 422 tons were handled by the Board, being sold to the East African Tobacco Co. A considerable quantity of coil tobacco (estimated at possibly 200 tons) moves from this area, largely to Ruanda Urundi where good prices are obtained. The Ngoni-Matengo Co-operative handles dark fire-cured tobacco grown in the Songea area; the higher grades are exported and the lower grades are sold for manufacture in East Africa.

The East African Tobacco Co. also purchased green leaf from peasant growers in the Tabora area of the Western Province and flue-cured it. A total of 17,171 pounds of cured leaf was derived from African growers during the year.

### *Pyrethrum*

The crop was handled by the Tanganyika Farmers' Association as agents of the Board. Northern Province flowers are normally sent to the Extract Corporation's plant at Nairobi and those from the Southern Highlands are baled at Iringa for direct export. Tanganyika and Kenya growers share a joint pool under the management of the Kenya Board which employs a local firm as overseas marketing agents. Relations between the two boards, the agents and the corporation became strained during the year, and the future is still in doubt.

### *Tea*

East African auctions were started during the year.

### *Other Crops*

There has been a general increase in the quantity and variety of crops sold by producers' co-operatives, or groups, directly to merchants or exporters. In the Southern Province co-operative societies handled, apart from coffee and tobacco, over 550 tons of sorghums, nearly 200 tons of sesame, 130 tons of cashewnuts and smaller quantities of other produce. A large Rungwe crop of 4,200 tons of paddy was also handled by co-operative societies.



## SECTION IV

### MAIN CROPS

Figures for the production of individual crops are given in Appendix III. As intimated last year, while these figures indicate comparative trends from year to year, some of them should be read with caution since a large percentage of many crops is either consumed or processed locally and in addition, as mentioned elsewhere, the proportion of crops passing through regular markets from which these estimates of production are derived is tending to fall.

#### *Sisal*

This important industry experienced another difficult year. Competition from Brazil with lower freight rates to the main consuming centres, the after effects of the Suez crisis, the labour situation and a generally dull market all played a part in reducing still further the prosperity enjoyed by planters in the early nineteen fifties. Although world consumption continued to rise slightly, the average price for all grades was in the region of £66 per ton c.i.f. as against £70 for 1956.

Production was adversely affected by the results of drought in 1956 and by reduced activities on some of the marginal estates. On the other hand quite extensive new plantings came into cutting and the final figure of 184,877 tons was only 885 tons below that of 1956. Exports amounted to 181,815 tons. African production from hedge-row sisal in the Lake Province declined still further to 200 tons.

Planters' Day at the Research Station again attracted a large gathering, and there is no doubt that many of the practices advocated by the research team are being adopted on an increasing scale. The application of potash to counteract "banding" disease, the use of sisal waste on nurseries and the addition of lime to soils whose calcium content has been too heavily drained are particular instances of this trend. A few estates are planting carefully costed ten-hectare blocks using every method which has been shown by research to have a beneficial effect on yield. The future of the industry may well hang on the economic success or failure of these important intermediate trials. If sisal can be economically farmed on intensive lines reduction in acreage, handling charges and basic cultivation costs will be possible; the areas thereby released can be utilised for fattening stock or cultivating alternative crops while resting from sisal. If, on the other hand, it proves uneconomic to grow the crop on these lines, the industry will have to face the consequences of steadily deteriorating soils. This would necessitate new capital for moving and re-erecting expensive plant, construction of new buildings and heavy clearing charges on new land: the old worn out estates would be little better than desert for many years to come. It is a difficult choice, but there is hope that research and enlightenment will win the day, especially if the plant breeders succeed in producing a variety with a higher yielding capacity per cycle.

The question of mechanising estate operations, especially new practices such as lime spreading, received consideration during the year, and increased attention will be given to this aspect at the Research Station. A major difficulty is the hilly and uneven terrain which occurs to a greater or less extent on most estates. Intensification of cultivation on reduced acreages would, however, make possible the elimination of the most difficult areas from the planting programme.

#### *Coffee*

*Mild Coffee.*—The 1956/57 crop was a fair one in all areas, although, as forecast, due to poor short rains in 1956, the Northern Province, which is the main producing area, only produced 9,238 tons (parchment) against 12,345 tons the previous season. As against that there were appreciable increases in the Southern and Southern Highlands Provinces. Altogether the crop amounted to 9,624 tons of clean coffee against 11,194 tons for the previous season.

Mention is made elsewhere of the schemes for increased production in African agriculture. Many such schemes envisage the development of coffee production, either in areas where it is already established or in areas where as yet there is no commercial



production. In these schemes more staff will be posted to supervise growers in correct planting methods, pruning and pest control, and seedling production will be markedly stepped up.

The use of dieldrin as a control measure against stem borer has continued to spread and in both Moshi and Bukoba was limited by the inability of commercial firms to deliver supplies of the insecticide at the time required. In Moshi District some  $\frac{3}{4}$  million trees were treated on African holdings in the 1956/57 season and plans were in hand to treat some 4 million trees in the 1957/58 season. The success of the pilot scheme in the 1956/57 season has brightened the prospects of extending coffee cultivation into a somewhat lower zone round Kilimanjaro where previously intense borer infestation was a limiting factor. Partly for this reason production of seedlings, which was doubled to 500,000 for 1957/58, will be again doubled to 1 million in 1958/59. Interest in the control of other insect pests of coffee continued to grow in most African areas.

The success of the Usambara Land Usage Scheme, where one of the main aims has been to get moderately steep land taken out of annual crops and put into permanent crops such as bananas and coffee, has resulted in greatly increased planting of coffee in that area and growers are anxious to obtain as good crops as possible by the adoption of pest control measures and sound agronomic practices. The yield potential is however lower than on Kilimanjaro and good management is a vital factor in obtaining economic returns.

In Rungwe the population have set themselves a very optimistic target of production, and are working with great enthusiasm, so much so that it is hard to keep pace with the demands on the advisory staff. Some of the highest quality coffee in the Territory was sold through the Rungwe Co-operative Union.

The Songea crop was lower than expected, probably owing to pest attacks: plans are in hand to improve pest control during 1958. In Kasulu the demand for seedlings far exceeded the supply; this is perhaps no bad thing because the available seedlings should receive extra care and attention. Marked progress was made in all aspects of coffee culture in both tribal areas on Mt. Meru.

Planting on non-native estates continued on a very appreciable scale in the Northern Province, particularly on the new properties which are being opened up in the Magara area of Mbulu District. It is expected that the yield potential from non-native enterprise will double itself during the next three years.

*Hard Coffees.*—The production of hard coffee in Bukoba again remained at about the 10,000 ton mark (clean coffee) and 7,522 tons of Robusta and 2,105 tons of Arabica were produced during the year. The quality of the crop was relatively poor due to heavy berry borer attack in the Robusta and to bad harvesting conditions generally. The standard of preparation for the market leaves room for improvement, but it is difficult to devise incentives while such a high proportion of the crop is sold by the grower as dried cherry. The curing works began the installation of bulking machinery which will turn out a more even sample. The average price for F.A.Q. at Bukoba during the year was Arabica Shs. 3/40 a pound and Robusta Shs. 1/93 a pound.

The Bukoba Native Coffee Board began to divest itself of many of its activities in preparation for July 1958 when it will merely become the statutory authority for a one-channel marketing order. The Tanganyika Coffee Board assumed responsibility for the expenses of Maruku Station other than personal emoluments which remain a charge on central government. The Co-operative Union took charge of all the coffee nurseries, but will continue to have free advice and assistance in supervision from a Field Officer (Agriculture). Here too the demand for seedlings far exceeded the supply, and this provided an opportune moment for instituting a charge in place of the erstwhile free distribution.

#### *Pests and Diseases*

White Stem Borer and Antestia are still the main pests of coffee, but effective practical control measures are available and are being increasingly used. *Stephanodores* is the main pest in Robusta in the Bukoba area. Last year's successful small scale insecticide trials were

followed up by "blanket" treatments on one or two large village areas. The effect of this operation on the general entomological balance is being assessed, and if no adverse reactions are discovered, the way will be clear for a widespread campaign. Elsewhere leaf miners and thrips are developing as serious menaces, and a D.D.T. resistant strain of the latter was found at Oldeani. The Entomologist, Lyamungu is working on both problems, but it would appear that leaf miners will be very difficult to control by insecticides, and other methods will have to be sought. *Hemilea* is also locally severe and the Plant Pathologist is engaged in research on the control of this disease. The condition referred to in last year's report as "bottling" has been found on young coffee only in most parts of the Northern Province, and is probably more extensive than was first thought, though perhaps not so alarming. In conjunction with E.A.A.F.R.O. the Plant Pathologist is continuing investigation into this disease, the cause of which becomes more and more baffling. Fuller reports of these and other research investigations will be published in Part II of this Report.

### Cotton

The Lake Province once again produced a record crop of cotton and African production in the Eastern Province was a post-war record. Final figures are not yet available, but the Lake Province hopes to reach the 150,000 bale mark and the Eastern Province 12,000. Production elsewhere was also good and the Territorial total should reach 167,000 bales.

The number of growers in the Lake Province increased from 218,850 to 268,000, but the average area cultivated fell slightly and the increased crop appears to be largely due to increased yields per acre, which were estimated to average 474 lb. per acre of seed cotton as against 421 lb. per acre last year. This yield is still far below the potential which could be reached if full use were made of all the improved techniques such as the application of manure and fertilisers, early planting, early thinning and better weeding. On Ukerewe Island in particular degenerating soils are giving cause for alarm. Nevertheless, interest in applying these techniques is decidedly on the increase.

The quality of the crop was below average, due largely to late picking which inevitably results in a larger proportion of pieces of leaf and sepal adulterating the seed cotton. More seriously, a dull grey condition developed through delayed picking, particularly in North Geita. The abandonment of part of the crop in the field resulted in a relatively low proportion of BR lint being produced except in Musoma where stainer damage again occurred. Unfortunately *Fusarium* wilt was found in the bulking area on Kome Island where the first multiplication of the new U.K. 57 strain was planted: owing to the possibility of the disease being transmitted by seed, the project was abandoned. A convenient disease-free area has been found for 1958.

In the Eastern Province a very gratifying response has been obtained to the dusting of cotton with D.D.T./B.H.C. dust. In Departmental demonstration plots cotton planted early and dusted yielded 2,850 lb. per acre of seed cotton, against 1,400 lb. for undusted cotton planted on the same date and 500 lb. per acre from cotton planted three weeks later. In Kilosa District 80 cultivators purchased dust and obtained average yields of 1,031 lb. per acre against normal yields for the district of 300 to 400 lb. per acre. By the end of the year 275 cultivators had already ordered dust for the 1958 season.

A new strain of cotton (Ilonga 58) has been shown to be superior both in yield and quality to the strain 47/10 hitherto grown in the Eastern Province and arrangements are being made to bulk this up; it is hoped to have sufficient to supply the whole province by 1961.

A small increase in production of cotton was obtained in the Nzega District of the Western Province. In other parts of this province growers are anxious to grow cotton but repeated trials have shown that insect attacks and climatic conditions make cotton growing in many areas uneconomic. The same remarks apply to the Southern Province where a small production is still obtained from Tunduru.

In the Northern Province a promising crop did not give the production hoped for, partly due to insect attack and partly due to the early onset of the short rains which badly damaged ripening cotton in the field. It is anticipated that 2,800 bales will be obtained.

The capacity of some ginneries in the Lake Province was increased to enable them to process the crop more expeditiously. In addition further mechanical handling devices were installed; in particular the use of weighbridges, though expensive, is becoming more popular as the result of successful pioneering by Mugango ginnery where a very appreciable saving in labour was achieved. False packing and ginning faults were still far too prevalent; the main causes for complaint are stripper damage and the inclusion of jute fibre derived from gunny bags, hessian and string. The Victoria Federation of Co-operative Unions was granted a permit to erect a second ginnery, sited at Ushashi, and this should be ready to operate in 1958.

The ginnery mechanics' apprenticeship scheme mentioned last year had a successful first year at Korogwe Ginnery through the co-operation of the owners, the Moshi Trading Company: its two-year course is expected to turn out highly skilled operatives well in advance of the majority now employed in the industry. The two Ginnery Inspectors are now directly employed by the Lint and Seed Marketing Board and continued to give advice and guidance to ginnery owners.

#### *Cashewnuts*

The planting of cashewnuts continued to expand, but the 1957 crop, which is not yet completely marketed, may not quite reach the 1956 production, which amounted to 23,400 tons. Marketing of the cashew crop has not been altogether satisfactory in the past, and many complaints were received from the buyers in India, who for the first time sent their own representatives to Tanganyika to arrange purchases of nuts. These representatives were much more selective in their purchases; for the first time there were indications that penalties for low quality were being passed back to the primary buyers, and through them to the growers.

*Helopeltis* continues to be the main pest and caused a severe reduction in the crop; the biology of the insect is being thoroughly studied at the Southern Regional Research Centre, Nachingwea, where the vegetative propagation of selected clones is also being undertaken. During the year a stem borer was found damaging a number of young trees in the Southern Province and it is possible that this pest will also prove of economic importance.

#### *Cassava*

This important local food crop is also a substantial export crop, particularly from the Southern and Eastern Provinces, but also from parts of the Western Province. The amount of root put on the market depends very much on the price offered and in the main producing area of the Southern Province it would seem that as soon as the price drops below Shs. 20/- per 100 kgs. the supply tends to tail off. This year prices were attractive throughout most of the year and 18,500 tons were exported from the Southern Province as against 17,500 in 1956; this is the first time that a reasonable level of exports has been maintained for two successive years. The quality of the produce, however, is inferior to that from Indonesia, and there is increasing competition from that source. Total exports from the Territory amount to 20,051 tons as against 24,000 tons in 1956. Investigations and inquiries regarding the possibility of establishing small, wet process cassava starch factories continued, but so far there have been no concrete developments.

In many districts wild pig remain the chief pest of cassava, although Mosaic would seem to limit the yield in many areas. Distribution of Mosaic-resistant strains continued, especially in the Tanga Province.

#### *Coconuts and Copra*

The increasing sales of fresh nuts both in the Tanga and Eastern Provinces coupled with the effect of poor rains at the end of 1956 led to a further decrease in the quantity of copra produced. Accurate production figures are impossible to obtain since the crop off the smaller non-native plantations goes direct to a number of small oil mills and cannot be assessed. There was a steady downward tendency in prices during the year with little or no incentive to produce a high quality. The oil from local mills is used almost entirely for the



manufacture of soap and moisture content of copra is therefore the only criterion applied by buyers: it is less trouble for the grower to sell some water with his copra at a lower price than it is to dry it thoroughly.

In Tanga over the last two years the Agricultural Officer has perfected a cheap and efficient kiln which was taken up by some of the more progressive African growers, and for a time they received an encouraging premium for their product. This premium, however, cannot be assured until they can increase production and combine to sell in 50-ton lots on the export market, and this is at present beyond their powers. In the meantime high fresh nut prices are a deterrent to this development.

Some new planting was carried out on larger estates, and also by Africans in Tanga. The coconut planting bonus scheme was closed down at the end of the year for any further new areas, but the subsequent maintenance bonus will be continued on a decreasing scale for five years in accordance with the undertakings implicit in the plan. Since the inception of the scheme in 1952, bonus has been paid on 3,210 acres of young palms by no means all of which will come to maturity.

Excellent quality copra was again exported from the estates on Mafia Island. Further improvements in cultural practices were introduced and the steady rise in yield over the last few years was maintained.

Research on the *Theraptus* sucking bug was taken over by the Colonial Pesticides Research Unit, and an entomologist was posted to Tanga for this purpose. Results from aerial spraying in 1956 did not justify a repetition of this operation. There is an indication that "tapering" disease can be cured, at least temporarily, by stacking husks, debris and soil round the foot of the palm to induce the formation of new roots.

#### *Maize, Sorghum and Millets*

(a) *Maize*.—With the removal of all control over maize and the reduction of the support price to Shs. 25/- per bag at the ports there was some reduction of the acreage planted to maize by non-African farmers, particularly in the Northern Province. The area planted by African growers, however, showed no tendency to diminish. The season appeared generally favourable to the crop and average if not bumper crops were expected in most areas, but returns from markets where figures are available did not bear out this promise. There is no doubt that appreciable quantities found their way over the Kenya border, attracted by high controlled prices. At the time of harvest, also, world prices were very favourable, and a considerable tonnage was exported. Eight hundred and forty tons went to Northern Rhodesia.

Pink ear rot did considerable damage to the crop in the Northern Province; this disease is becoming sufficiently important to warrant special attention. A fixed *Polysora* rust-resistant strain of Katumbili has been produced by the Tanganyika Agricultural Corporation at Nachingwea and is being bulked up on the Corporation's farms. Stalk-borer damage was not quite so prevalent as in past years; the season was less favourable to the insect in some areas and in others insecticidal treatments were applied, albeit on a very small scale. Maize breeding work continued at the Departmental Research Centres at Nachingwea, Ilonga and Tengeru and further details are published in part II of this Report.

(b) *Sorghum*.—Although the tendency is to replace sorghum with maize, for reasons of palatability and security from bird damage, sorghum remains the chief food and beer crop over large parts of the Territory. Crops in general were good in 1957 although there was some localised damage due to excess rain. With the departure on transfer of the Botanist mainly responsible for sorghum breeding, work has been curtailed until he can resume his activities in another sphere. SUK.1, which had been bred at Ukiriguru, has not proved generally acceptable and further distribution has ceased.

(c) *Millets*.—The production of bullrush millet in parts of the Lake and Central Provinces where it is a staple food was well up to average. The finger millet surplus in the Western Province doubled to reach nearly 3,000 tons.

### Oil Seeds

Apart from the increase in cotton production which resulted incidentally in an increase in the quantity of cotton seed available for oil extraction, the main feature of the year has been the marked increase in the production of castor seed. This crop is particularly useful in providing a cash crop in the drier areas of the country.

(a) *Castor*.—Prices were high during the early part of the year and this stimulated planting on an expanded scale. A steady fall in price from £75 to £55 per ton c.i.f. during the marketing season caused some disappointment, but a substantial increase in exports to 13,894 tons from 12,012 tons in 1956 was recorded. The crop is very susceptible to damage by insect pests, particularly if it is early planted. Of these a species of *Helopeltis* which attacks the flowering “candles” is the most important; it can be controlled by insecticides, but the cost of such treatment would only be covered by very high yielding strains, and a search is therefore being made for possible resistant types. Hulling and the subsequent separation of the seed from the capsule sections present mechanical problems which have as yet only been partly solved. In spite of these difficulties there is a growing interest in the crop for planting on the larger farms in many parts of the territory.

(b) *Groundnuts*.—In the Southern Province the season was a relatively poor one for groundnuts. On the Tanganyika Agricultural Corporation farms the average yield dropped from 820 lb. in 1956 to 626 lb. of shelled nuts per acre. In the African areas of the province yields were similarly disappointing. In the Western Province there was a considerable increase in the acreage planted to groundnuts, which is the most attractive cash crop for many areas. Good yields were obtained in Nzega but elsewhere production was disappointing. Production in the drier areas of the Lake Province and in the Central Province also tends to increase. Interest in the crop is developing in the Northern and Southern Highlands Provinces.

In the Southern Province a start was made to distribute the variety “*Asiriya Mwitunde*” and selected villages in Masasi District were flooded with the seed. The reaction by farmers was in general favourable as “*Mwitunde*” withstood insect damage much better than local varieties. There were, however, some criticisms of the variety on the grounds of palatability and oil content. Five tons of seed were bought back and distributed to other villages for the 1957/58 season. There is a possibility that certain speciality types which command a market premium may be suited to localised areas and trials were started. The museum collection of over 200 varieties maintained at Ilonga is proving of great value in this work.

(c) *Sesame*.—The main production area is the Southern Province where interest in the crop was sustained after the record harvest of over 10,000 tons in 1956. The harvest in 1957 amounted to some 5,900 tons which compares well with an average of 2,123 tons for the years 1947/55 inclusive. The control of flea beetle in the early stages of the crop is one of the main factors for success and every effort is being made to popularise D.D.T. dusting which, if applied correctly, can control the pest.

Some work on this crop is being carried out at Nachingwea Research Centre and interest has been aroused in certain varieties of sesame imported from Venezuela which show promise of giving yields of over 1,000 lb. per acre. The highest recorded yield on the Tanganyika Agricultural Corporation tenant farms using local varieties was 508 lb. per acre over 2.34 acres and the average yield is of the order of 200 lb. per acre.

(d) *Sunflower*.—The price of sunflower seed remained at steady though not particularly attractive levels during the year. Nevertheless it is such an easy crop to grow, harvest and thresh that it is popular in many areas, among these being the alienated farms at Wami/Magole. On small holdings it is frequently interplanted among other crops. The season was generally propitious and there was an appreciable increase in production: exports amounted to 19,626 tons as against 14,729 tons for 1956.

(e) *Wild oil Seeds*.—*Trichilia emetica* and *Allanblackia uluguruensis* with *Allanblackia stuhlmanni* form the basis of small industries in the Southern Highlands Province and Eastern Province respectively.

### *Pulses*

Many different leguminous grains are grown in the territory; they form an important element in the staple diets of many tribes and provide a useful cash crop for sale as an ingredient of labour rations. Mixed beans, haricot beans, pigeon peas, cow peas, chick peas, bambarra nuts, green gram and yellow peas are all grown in different areas and the surplus production is marketed. In the Northern Province a spell of continuous rain during the latter half of April played havoc with the mixed bean and haricot crops but elsewhere production of all the leguminous grains was normal with a very good yield of chick peas in the Lake Province.

The production of soya bean was largely confined to the Tanganyika Agricultural Corporation farms in the Southern Province and to one or two estates in the Eastern Province. Trials with the crop are continuing elsewhere and very promising yields were obtained from off-season plots on the Rufiji Basin Survey's pilot irrigation schemes. One of the main attractions of the crop is that it can be fully mechanised.

In the Northern Province European farmers made a determined effort to establish the Michigan Pea Bean for which there is a large market for canning. Unfortunately the season was quite the worst season for beans that has been recorded for many years and the harvest was practically a complete failure. It is not, however, intended to drop this project.

### *Pyrethrum*

The Pyrethrum industry operated during the year under a cloud of threatened over-production, and there is a prospect of a substantially increased carry-over when the joint Kenya/Tanganyika pool year closes in March, 1958.

Production in both the Northern Province and Southern Highlands Province continued to rise, conditions in the main producing area of the Northern Province being generally favourable. The joint pool challenge cup awarded for the highest yield of pyrethrins per acre came to Tanganyika for the first time and was won by Mr. Robin Johnston of Ol Molog. Yields per acre on non-native farms in the Southern Highlands Province show signs of diminishing and in the principal centre of Uwemba were only about 250 lb. per acre as compared with about 300 lb. per acre last year; on the new farms, however, up to 1,000 lb. per acre was obtained. A considerable experimental programme is carried out in this area with the co-operation of the Uwemba Farmers' Association and the Government Chemist; results are liable to be conflicting owing to the wide variation in soil types. A potash deficiency has been suggested as the cause of poor yields, but there is as yet no confirmatory evidence from field trials.

In both the Southern Highlands and Northern Provinces African growers are entering the industry and, although production by Africans is as yet only a fraction of the production by non-natives, there is a considerable potential in both provinces which unfortunately, in view of the poor marketing position, cannot be realised as quickly as might otherwise be the case. From a labour point of view pyrethrum is an ideal crop for small holders.

### *Rice*

In the Rufiji delta, which is the main rice producing area of the territory, a late flood in mid-May severely damaged what was a promising crop and only 5,128 tons of paddy were marketed which, while a great improvement on the previous year's disastrous harvest of only some 600 tons, was well below the 1955 record of 13,842 tons of paddy.

The other main producing area—the lake shore of Tukuyu District in the Southern Highlands Province—had a good year producing over 4,000 tons and the Usangu area of Mbeya District also produced over 1,000 tons.

In the Western Province production increased by about 40 per cent to 2,761 tons and good crops were also obtained in the Lake Province. In the Tanga Province the crop was a record but the increasing proportion of red rice in the sample is causing millers some concern. Total territorial sales in recognised markets amounted to 26,545 tons of paddy but it is known that considerable quantities were sold outside these markets in addition to local consumption.



A survey on the small Mlali irrigation scheme showed an average yield of less than half that obtained on the departmental plot where one variety reached 5,000 lb. per acre. This fact has been driven home and there is evidence of improved practices being adopted in the 1957/58 season.

A rice expert from the Food and Agriculture Organisation visited the territory during the latter part of the year and his report is awaited with interest.

### *Seeds*

There was no major change in the organisation of the seed bean industry centred in the Northern Province, but growers experienced their most disastrous season for many years. A prolonged wet and sunless period from mid-April to mid-May ruined crops which suffered severely from waterlogged soils. Bean rust was very severe, particularly on the white seeded varieties which are particularly susceptible and other diseases took their toll. The condition known as "oily pod" was recorded again and afforded an opportunity for another attempt to track down the causal agent or conditions which lead to the disease. It was confirmed that varietal reactions vary considerably and that one variety in particular is very susceptible, but no satisfactory explanation of the condition has as yet been put forward.

Some growers are attempting to introduce seed bean growing into the Mpwapwa and Mbozi areas of the Central and Southern Highlands Provinces respectively; there is great promise in the former area, but anthracnose attack was severe in the latter. Seed peas, which are grown particularly in the Ol Molog area of Moshi District, are also being tried in the Southern Highlands Province where they offer prospects of success.

### *Sugar*

There is still only one estate producing white sugar in Tanganyika, that of the Tanganyika Planting Company in Moshi District. Negotiations for the alienation of an area in the Eastern Province were suspended, but interest has been displayed by alternative concerns. An area of 5,000 acres was alienated for sugar cultivation in the lower reaches of the Ruvu valley.

Production on the Tanganyika Planting Company estate at Moshi continues to increase, having gone up from an average of about 10,000 tons in the years 1952/55 to 18,000 tons in 1956 and 18,400 tons this year with a prospect of 25,000 tons in 1958. The company is employing their own Agronomist to improve its sugar cultivation and water usage (the estate depends on irrigation) and also to endeavour to produce alternative rotation crops.

The production of jaggery is mainly confined to the Eastern Province and to the Bukoba District. In the former area about 1,700 tons are thought to have been marketed, chiefly to sisal estates. Jaggery is sold by the frasila of 36 lb. for which the price improved from Shs. 9/- to Shs. 13/- during the year.

### *Tea*

In the Southern Highlands excellent flushes were obtained during the early months of the year, but the abnormally long dry spell after the main rains caused wilting and a severe drop in yield. Nevertheless the total crop for the year was higher than in 1956. Average yields of made tea per mature acre were 600 lb. at Mufindi and 670 lb. at Tukuyu: some of the former was of particularly high quality.

The new estate at Lupembe planted 30 acres and had a further 60 acres ready to plant at the end of the year. On the new estate at Uwemba 150 acres of young tea are established and a further 100 acres were prepared for planting; growth of the earliest plantings is rather slow.

Seventy-eight thousand, six hundred and sixty-four lb. of seed valued at £25,600 was exported, mainly to Kenya.

In Tanga Province, although the weather was not particularly kind, the provincial figures of production showed considerable increases as a consequence of recently planted areas coming into production. Clearing and planting of new gardens in the Eastern and Western

Usambaras continued at an accelerated rate during the year and the planted acreage amounted to 6,114 acres at the end of the year. Three new factories are under construction, one of which is installing machinery of the latest design which cuts the processing time by half.

The total territorial production in 1957 amounted to 2,800 tons of manufactured tea as compared with 2,400 tons in 1956.

### *Tobacco*

(a) *Flue-Cured*.—1957 was the second season in the change over from Ehlers to Virginian tobacco in the Southern Highlands and the satisfactory financial return obtained by the growers has put new heart into the Iringa area. The season was good for tobacco production; 1,260,019 lb. of Virginia and 835,806 lb. of Ehlers were produced compared with 376,193 lb. and 2,362,090 lb. respectively in 1956. This was all sold through the Tobacco Growers' Union and was mainly purchased by the East African Tobacco Co. The average selling price to the ultimate buyer was Shs. 3/46 per lb. for Virginia (compared with Shs. 3/25 in 1956) and Shs. 2/25 per lb. for Ehlers (compared with Shs. 2/20 in 1956).

The standard of tobacco farming in the area still leaves considerable room for improvement but the growers now have far more confidence in the advice of the Research Officer and Extension Officer stationed at the Tobacco Board's Research Station at Seatondale and there is every reason to hope for a steady improvement in the standard of tobacco cultivation.

After successful trials carried out by the Department the further development of flue-cured tobacco in the Chunya area has been handed over to the Tanganyika Agricultural Corporation who will first test out the growing of the crop on a commercial scale and, if successful, it is the intention to establish an African tenant farming scheme similar to that which has been successfully initiated at Urambo.

In the Western Province the Tanganyika Agricultural Corporation farms produced 597,000 lb. of leaf, but the quality was somewhat below that of the previous year. Both here and at Iringa the main problem facing the research stations is to get more body into the leaf. The African green-leaf scheme organised by the East African Tobacco Co. was less popular, there being 241 growers as against 330 in 1956; the average yield was only 107 lb. of cured leaf per acre, although the Company averaged 689 lb. on their own farm.

Sowing for the new season was done in very good time, but the standard of seed bed management in Iringa was disappointing. At Urambo and Chunya *Anthraxnose* appeared in the beds and did considerable damage; it is thought to have been brought in on imported seed. The Plant Pathologist paid an urgent visit and instructed growers how to control the disease, but new beds had to be planted and much of the crop will be late in consequence.

The only outlet for Virginia leaf grown in Tanganyika at present is to the East African Tobacco Company, and production has very nearly reached the amounts which the Company is prepared to purchase. The industry therefore has to face the alternatives of stagnation or of finding export markets at prices which will not have the protection of import duties. The latter choice is clearly preferable, but it would necessitate the formation of a territorial pool under a marketing agency in order to level out to the growers the price differentials obtained in different markets. A preliminary meeting of growers' representatives was held during the year and agreement in principle to territorial marketing was reached. One section of growers subsequently recanted, and no further progress can be recorded; the project will not, however, be abandoned.

(b) *Fire-Cured*.—In the Kibondo District of the Western Province a good crop was produced by 7,077 growers, an increase of 1,247 over the previous year. The Nyamirembe Native Tobacco Board purchased and resold 387,246 lb. of cured leaf against 359,606 lb. in 1956, but it is estimated that this represents only about one-quarter of the total production, the balance being made into coil tobacco and sold either in local markets or in Ruanda-Urundi. Production in the adjoining districts of Biharamulo and Ngara of the Lake Province decreased considerably, only 1,983 growers planting as against 3,602 in 1956 and producing 78,400 lb. of leaf as against 191,840 lb. in the previous year.

In the Songea District production of fire-cured tobacco declined still further, largely owing to a lack of agreement on policy and a disinclination among the various parties concerned to pull together. Determined action on the part of the department has now roused fresh enthusiasm for a crop which is admirably suited to conditions in the district. A firm, progressive policy involving improved cultural methods and the construction of efficient curing barns has been agreed by all, and growers have started the new season with renewed heart. The Field Officer of the district was sent on a special study tour to Nyasaland and for the 1957/58 season 600 lb. of treated seed have been distributed which could result in a bumper crop. An even more encouraging sign was the very large number of seed-beds prepared in October as opposed to the December-January plantings which had become prevalent of recent years.

#### *Wattle*

The Tanganyika Wattle Estates of the Colonial Development Corporation at Njombe, having completed their planting programme in 1956, have been concentrating on the care and maintenance of the 33,000 acres planted and at the same time have been proceeding with the erection of the tannin extract factory which is expected to commence operations in 1958.

The associated Bena wattle scheme continues to develop satisfactorily with the full confidence and assistance of the local Native Authority. Of the total coupe of 2,559 acres in 1956/57 a balance of only 220 acres was not taken up by individuals and is being operated by the Native Authority directly. Two thousand, three hundred and fifty-two acres were prepared for seeding in the 1957/58 rains, and survey and demarcation of some 2,300 acres for the following coupe is well advanced. Dieback is doing some damage in certain areas already planted and spraying with sodium borate was advised.

The export of chopped bark from the Usambaras dropped considerably to below 1,000 tons because of restrictions on the importation of this commodity imposed by India, which country had been the main buyer for several years previously. However, a small extract plant, capable of processing 5,000 tons of bark per annum, has been built at Lushoto by an Anglo-Dutch firm which is arranging to make all its purchases through the Usambara Farmers Co-operative, a popular move with the local growers. Wattle planting as a conservation measure both in the Usambaras and the Pares was encouraged and stimulated by issues of seed; the response has been most satisfactory. In one area the chief eliminated communal grazing rights on a number of eroded hillsides and allocated the land in one acre holdings for wattle planting to the great satisfaction of 90 per cent of the population, who did not own large numbers of cattle. In these areas there is a good market for wattle poles as a safeguard if the bark market falls on evil days.

#### *Wheat*

The 1956/57 short rains crop in the Northern Province, which is confined to the Ol Molog area in Moshi District, was very poor, the area suffering one of the worst short rains droughts recorded since the farms were first opened up in 1952. The long rains crop in the Northern Province was poor, even by comparison with recent years, as rust once again took a very severe toll, particularly of the short term wheats suitable for the lower altitudes of Oldeani and Ngare Nairobi areas. The only ray of hope in this respect is that one or two promising new varieties of short term wheats appear to be resistant to the current strains of stem rust. One of these H.462 has been bulked up to the 200-bag stage and if further bulked in the short rains 1957/58 crop a substantial amount should be available for the 1958 main rains crop.

The short rains crop, such as it was, escaped the depredations of the Sudan dioch and for a time it looked as though the long rains crop also would not be badly attacked. However, the crop was very late in maturing; harvesting was prolonged right up to the beginning of the short rains, and a very heavy invasion of dioch took place, as recorded elsewhere in this report. The continued depredations of these birds are giving rise to considerable despondency as regards the future of wheat growing in the Northern Province in spite of improvements in control techniques. There is a belief that the development of wheat in West Kilimanjaro and Ol Molog over the last few years has provided the bird with a source of food which just tides it over what was previously a "hungry gap" right in the middle of the annual migration route up and down the Rift Valley.



Elsewhere in the territory some good wheat crops were planted by European farmers at Mbozi in the Southern Highlands, but the remoteness of this area from any milling facilities and markets may militate against development of the crop there. Wheat growing appears to be extending in the Njombe District as an African grown crop but this production is largely consumed locally. Some African production of wheat also occurs in the Songea District of the Southern Province and in other mountainous areas in different parts of the territory.

The Botanist at the Tengeru Agricultural Research Centre is charged with the production of rust resistant short-term wheat suitable for Northern Province conditions. He is working in close collaboration with the Senior Plant Breeder, Kenya Department of Agriculture, in this work which is referred to in greater detail in Part II of this report.

## SECTION V

### MINOR CROPS

Many minor crops are grown in the territory, some of which are locally important. Essential oils, derris, rubber, raffia, and cinchona bark are produced in relatively insignificant quantities at various places. Betel nut planting along the lower Pangani increased and the sale of this crop brings in a substantial revenue to a small area. The collection of gum arabic and gum copal is a steady source of income in some of the drier areas of the Western and Central Provinces. Other minor crops grown more substantially or of greater potential interest are:—

#### *Barley*

There is a considerable production of barley in the West Kilimanjaro area of Moshi on European farms. A proportion of this crop is taken by E.A. maltsters and the balance is sold for feed or used on the farm. With the development of pig rearing in the area and the hazards attached to wheat production, barley growing will probably tend to increase. Production also continued in the Mporotos area in the Southern Highlands Province.

#### *Chillies*

A number of estate owners in various parts of the territory produce chillies. There is no organized trade and the success or otherwise of chilli growing appears to depend on the grower establishing a regular market and quality.

#### *Cacao*

The estate at Maramba in Tanga Province, which is planting cacao on a large scale, made very promising progress during the year and the first planted trees began to bear a few pods. Consideration is being given to trying out the crop in certain other limited areas: it is very suitable as a smallholder's crop, and long-term market prospects appear good.

#### *Onions*

Onions are a very substantial minor crop in many parts of the territory. Production under irrigation appears to be increasing, particularly in Arusha District, and there is a well-established market based on Arusha which handles crops grown in other parts of the Northern Province and in the Central Province. Elsewhere in the territory production appears to be limited to a large extent by local demand, but there is an appreciable industry in the lower areas of the Southern Highlands. Unfortunately onions do not keep well in Tanganyika, and imports have to be made in the off season. The storage problem is worth following up.

#### *Potatoes*

European potatoes are a substantial minor crop in certain areas of the Northern, Tanga and Southern Highlands Provinces. An increasing quantity is being consumed by Africans and there are good markets in the coastal towns. The blight resistant variety 1521c (3) mentioned in last year's report has not found favour everywhere on account of lack of flavour. Other varieties reputed to show blight resistance are being tried where blight is a limiting factor. Here again there are seasonal difficulties, both in preserving seed and in keeping a regular supply on the markets.

### *Fruit and Vegetables*

Apart from production for purely local consumption the main centres of vegetable production are the Uluguru and Usambara mountains in the Eastern and Tanga Provinces respectively: Iringa and to a lesser extent Mbeya are also important producing areas. The production of European type vegetables in the Usambaras has increased markedly in recent years; the quantity passing through the two markets at Soni and Malindi where records are kept reached 700 tons in 1957 compared with 516 tons in 1956 and 17 tons ten years ago. In order to assist in improving and extending vegetable growing the Department, at the request of the Native Authority and with funds provided by the local Treasury, is now producing seedlings of selected varieties of vegetables at 12 nurseries for sale at half a cent per seedling. Between June, when the scheme started, and December over 332,000 seedlings were sold, with demand in considerable excess of supply. The vegetables from the Usambara area go to Tanga and Mombasa and increasingly to local markets in the villages in the sisal areas.

In the Ulugurus production for the Dar es Salaam market is increasing but the marketing of the vegetable crops from that area has never been satisfactorily organised and there are no price differentials to give an incentive for the production of better quality produce.

There is a substantial production of pineapples and of citrus fruit (mainly oranges) in the Muheza area of Tanga Province. In 1957 returns were remunerative, and the fruit was distributed to Mombasa and along the railway line to Moshi, Arusha and Nairobi. Although there is a canning factory at Muheza prepared to purchase pineapples, the demand for fresh fruit is so large that growers are not interested in selling to the factory at the price which could be paid for canning pineapples.

Oranges are produced in the Kisarawe District for the Dar es Salaam market, which is also supplied from Matombo on the Southern foothills of the Ulugurus; much of the latter crop, though of excellent quality, rots on the ground owing to the high cost of transportation from such an isolated area.

The very considerable local trade in bananas in various parts of the territory should not be overlooked. The Usambaras is rapidly developing into an important producing area with a ready market on the sisal estates below, and the export trade between Pangani and various coastal ports was well maintained.

### *Kapok*

Good crops were recorded from all producing areas this year but prices at about 50 cents per kilo (unginned) were most unattractive and a substantial proportion of the crop was not harvested. At the present level of demand the extensive plantings made during the last few years and not yet in full bearing will be almost worthless.

### *Oil Palm*

In the Luichi Basin near Kigoma the scattered small groves of oil palms produced a slightly increased crop. Two small presses were operated and a third was ordered. Rather more attention was given to the care of groves, but young plantings did not equal the number of palms destroyed for wine making.

The only estate in Tanga Province produced 27 tons of oil. Some seedlings were distributed for valley bottom planting in the Southern Province, but yields from the department's seed plot were not very encouraging.

Locally produced red palm oil is a useful asset for labour rations, but so far no particular area of the Territory has been discovered where oil palms would provide the most lucrative commercial crop.

### *Papain*

Prices for papain were at a remunerative though not spectacular level throughout the year. Since the war, whenever the price cycle reached the region of Shs. 25/- per lb., there has usually been a speculative rush to plant which subsequently caused over-production and a catastrophic drop in price. This feature was fortunately absent from the 1957 situation and

it is hoped that this small but potentially lucrative industry will now settle down to steady production in areas which are specially suited to the crop. The newly alienated farms in the Babati neighbourhood come under the latter category, and some planting was done during the year.

### *Spices*

Production of black pepper in Tanga Province remained static at about 1,500 lb.; at 4/- per lb. it is quite an attractive smallholders' crop and greater interest was displayed in planting. In the same province cardamon production increased to about 3 tons priced at Shs. 7/- to Shs. 9/- per lb.; trials with this crop in Rungwe District offered some promise, but it needs very specialised conditions for optimum growth. There was some demand for clove seedlings, but the cultivation of this crop except for local use is being discouraged. Such cloves as have been harvested from trees in Tanganyika are very small in size and could not compete with produce from Penang or Zanzibar on the world market. There should be good prospects for ginger in the wetter, medium altitude areas, and a small pioneer quantity from Amani found a ready local market.

## SECTION VI

### VERMIN AND GENERAL PESTS

#### *Pests of Stored Products*

The use of grain protectant dusts by African peasants is increasing considerably in some areas; quantities of a ton at a time were recorded as being ordered for resale by retailers. They were mainly lindane formulations, and it is unfortunate that the pyrethrum industry was not ready to come in on the ground floor of this very promising market at competitive prices.

As noted last year, the Khapra beetle (*Trogoderma granarium*) was recorded in Zanzibar and immediate steps were taken to prevent its introduction into Tanganyika by the promulgation of legislation requiring any cargo likely to carry the insect to be fumigated before leaving the port area. The need for this action has been abundantly shown by the fact that several ships with heavy infestations of *Trogoderma* have discharged susceptible cargo at Dar es Salaam, and although the implementation of the fumigation orders causes importers considerable inconvenience and expense, the Dar es Salaam Chamber of Commerce has given the Department every support in trying to ensure that the insect does not gain a foothold in Tanganyika.

#### *Grain-eating Birds*

The short rains in the Northern Province in 1956/57 were a failure and, possibly because of this, there was little trouble from the Sudan Dioch (*Quelea quelea aethiopica*) on the short rains wheat crop on West Kilimanjaro, only three small roosts being located and attacked. The search for nesting sites during the period March to June was severely hampered by the heavy rains which fell over most of the Central region where it is thought the main breeding occurs. The Field Officer (Bird Control) had to abandon his transport in Masai District for a period of about three weeks owing to being cut off by floods; movement by any means over large stretches of country was impossible for a period of several weeks. Eleven nesting sites were located and eight of these were destroyed, either with flame throwers or tribal turn-outs. An estimated 37,100,000 birds were destroyed.

The heavy main rains resulted in a plentiful supply of grass seed being available and for a time it appeared that the long rains wheat crop on West Kilimanjaro might escape unattacked. However, the birds eventually arrived in very large numbers towards the end of the season and considerable damage was done. Roosts were attacked with fuel bombs and also, for the first time, with Parathion spray applied from the air. This method of attack was highly successful on scattered roosts in open conditions which would have been very expensive to deal with by the fuel bomb method. Altogether 13 roosts were destroyed with fuel bombs and 10 were attacked with Parathion aerial spray, resulting in estimated kills of 3,287,000 and 2,890,000 respectively.



Over 4,100 birds were ringed during the year, in spite of very unfavourable conditions for trapping. The most noteworthy recoveries have been two birds ringed in Mbulu in October, 1955, which were recovered at Thompson's Falls and Sotik in Kenya in January, 1957. General observations on the movement of birds have continued and have confirmed that there is a general movement up and down the line of the Rift Valley following the long and short rains. This year a larger number of birds than usual appeared to remain in the area between West Kilimanjaro and the Rift wall in Northern Tanganyika. The Zoologist continues investigations on the breeding cycle of the Dioch and has published preliminary data in scientific journals.

#### *Vermin*

Damage by pig, porcupine and baboon continued to be a source of annoyance and considerable loss. Organised control operations were mounted from time to time in various areas, and particular mention must be made of the successful campaigns against porcupines in the Lake Province. In some parts of the Territory continual pressure is beginning to arouse a sense of self-protection, but the general attitude is all too frequently one of apathy, and the initiative to organise local effort almost invariably has to come from outside. Damage by buffalo, elephant and hippo can be locally serious and there is some conflict between the need to protect crops and the desire to preserve the greater game animals. Electric fences are of some value in protecting small areas, and where a high standard of maintenance can be applied. Generally speaking they are not practical as a means of protecting African-grown crops.

#### *Locusts*

The Territory remained free from locusts. The red locust outbreak areas in the west were kept well under control by the Organisation. The establishment of the latter was reduced, but two Field Officers were selected for special training so that they could be called up in emergencies. The desert locust threat developed serious proportions towards the end of the year, and a striking force of officers and vehicles stationed in the areas of probable invasion was organised.

### SECTION VII

#### LAND PLANNING, SOIL AND WATER CONSERVATION AND LAND USAGE SCHEMES

Mention was made in last year's report of the appointment of an Agricultural Officer (Land Planning) whose duties were to undertake surveys of areas where definite schemes of development were proposed. Many such schemes are based on the provision of irrigation water. During the year a second Agricultural Officer (Land Planning) was appointed and these two officers were stationed at Iringa and Tengeru respectively. They investigated a large number of projects in the Northern, Central, Eastern, Southern and Southern Highlands Provinces and provided reports and data on which Provincial Teams could base recommendations for further action.

In connection with the work of these officers it has become evident that a basic necessity in many instances is the provision of an adequate map showing such topographical features, slopes and soil types as may be necessary for that particular investigation. In order to provide such maps when not available from other sources a Survey Service has been set up within the Department staffed by a Senior Field Officer, a Field Officer and a number of African surveyors withdrawn from the Mechanical and Survey Services in the Northern Province. An intensive training programme was initiated to multiply the number of African Surveyors for this work.

Meanwhile soil conservation work occupies a large proportion of all officers' time and energy. The Mechanical Services in the Northern Province and Southern Highlands Province executed planned conservation works for hire, mainly on alienated land. The new Iringa unit in particular had a very successful year, and won unstinted praise from the farming community. The following work was carried out during the year:—

*Northern Province, Tengeru:*

|                                                    |             |
|----------------------------------------------------|-------------|
| Terraces ... ..                                    | 1,016 acres |
| Disc Ridging ... ..                                | 4 acres     |
| Training Banks ... ..                              | 25 acres    |
| Diversion Ditches ... ..                           | 20,610 feet |
| Water Furrows ... ..                               | 21 miles    |
| Roads ... ..                                       | 147 miles   |
| Firebreaks ... ..                                  | 23 miles    |
| Dams ... ..                                        | 4           |
| Night Storage Tanks ... ..                         | 3           |
| Air Strips (Including Arusha Aerodrome) ... ..     | 3           |
| Levelling of sites for Playing Fields, etc. ... .. | 7           |

*Southern Highlands Province, Iringa:*

|                            |             |
|----------------------------|-------------|
| Terraces ... ..            | 1,595 acres |
| Diversion Ditches ... ..   | 11,324 feet |
| Water Furrows ... ..       | 5,080 feet  |
| Training Banks ... ..      | 2,076 feet  |
| Roads ... ..               | 64 miles    |
| Gully filling ... ..       | 41 hours    |
| Miscellaneous works ... .. | 324½ hours  |

In most districts the best form of soil conservation has now become established and according to locality and conditions emphasis is placed on tie ridging, trash bunding, contour banking, hedging, strip cropping and similar protective measures. While there can be no relaxing the pressure on the farmer in many areas to carry out and maintain such works, it is becoming more and more realised that soil conservation must become an integral part of the farming system if it is to be a permanent feature of agricultural practice. Under changing political conditions it is no longer practical to enforce unpopular soil conservation measures by legislative authority; it is a welcome sign that, in several areas where rules have been abolished, the particular practices which were enforced have after perhaps an initial setback, been taken up again by the cultivators and are being adopted as normal farming custom. Manuring and tie ridging in Sukumaland, ridging, terracing and the planting of permanent crops in the steep land in the Usambaras, trash bunding in Mbulu have all survived the relaxation of the orders which previously enforced them; their acceptance by the very people who had previously protested against them indicates the basic soundness of departmental policy in these areas and the increasing confidence which the African cultivator is placing on official agricultural advice.

In many areas the main obstacle to adequate conservation remains the practice of communal grazing and the solution of this problem will not be easy, bound up as it is with social customs, lack of well-distributed water supplies and the inherent conservatism of peasant communities. In other than purely pastoral areas, the emphasis which is being placed on the full integration of stock into the farming system and an increasing desire on the part of more progressive farmers to enclose and manage their own paddocks are indications that the seeds of future improvement have been sown and are beginning to germinate.

Of specific schemes the most remarkable development during the year was in the Usambaras. It was considered politic this year to cancel the Land Utilisation Rules made by the Usambara Native Authority together with all their penal sanctions. After a few weeks of mainly vocal disregard for the principles of good husbandry which were involved, the good sense of the largely inarticulate majority of the peasantry who had been following the recommended methods long enough to be convinced of their economic value re-asserted itself, and many of the "rules" have been re-established as "native law and custom". The upshot was that a larger area of permanent crops was planted during this year's "vuli" rains without a compulsory rule than had been done in any year whilst the rules were in existence.

Equally good progress was made with the terracing of irrigable land: and the indiscriminate burning of bush and crop residues, after a few initial bonfires, has practically ceased in the face of public opinion expressed by those who had for several years enjoyed protection from fires started by other people. The facts that springs are beginning to flow again and that maize is now seldom in short supply have not passed unnoticed, and with the increasing development of economic crops such as fruit, vegetables, coffee and wattle bark, the physical aspect and mental outlook of the district are quickly changing.

The principles of the Usambara Scheme have, at the enlightened request of the people themselves, been applied in the Pare mountains. Enthusiasm is rife and progress in this area is virtually only limited by the numbers of trained staff which can be put in the area for instruction and advice.

In the Ulugurus, on the other hand, where active conservation work ceased in 1955 following on tribal disturbances, the year has been mainly devoted to trials for assessing various conservation measures and on the establishment of possible permanent crops in the southern foothills. Attempts to gain the confidence of the people were made by offering advice and guidance on practices which can show some immediate return such as the production of new and better vegetable crops and the preparation and pruning of coffee together with the provision of coffee seedlings for increased planting. Permanent crops undergoing trial include sago, oil palm, rubber, derris, litchi, cloves and cacao. The traditional Mgeta terrace type of cultivation was extended on the western side of the hills. Progress was slow, but sudden sweeping fires are a feature of the Ulugurus, and with perseverance there is little doubt that the spark of favourable public opinion will be lit before long.

The possibility of initiating a tenant farming scheme based on cotton as the main cash crop at Kisaki on the south-east of the Ulugurus was investigated by the Agricultural Officer (Land Planning) and local agricultural staff; proposals were subsequently made to the Tanganyika Agricultural Corporation which it is hoped will manage the scheme. A sub-station was opened to obtain agronomic data on which to base the cropping plan.

In the Northern Province the development of some 600 square miles of country in the western expansion area of Mbulu District, which has been cleared of tsetse by communal labour in the last few years, came under review and the survey services prepared a map of the area as the basis for future planning. The main objective will be the development of water supplies on a pattern which will facilitate grazing control and the regulation of stock numbers. Mention should also be made of the settlement of the large area of tsetse-infested bush between Lake Manyara and Babati by alienation. This area was partially occupied up till the early 1940s but had to be completely evacuated because of sleeping sickness. The whole area has been carefully demarcated into farms in such a way as will, it is hoped, result in the tsetse being driven out within a period of five years. The operation was planned by the Northern Province Land Utilisation Committee which, under the chairmanship of the Provincial Commissioner, comprises unofficial as well as departmental representatives. The majority of the farms are now occupied and the Agricultural Officer (Farms and Estates) is giving every possible assistance in the detailed planning of individual farms.

In the Southern Highlands Province the first stage of a water conservation scheme in the Mbozi area was completed by the construction of small dams or water barriers in certain rivers by the Water Development and Irrigation Department. Following on a further survey of the area by the Agricultural Officer (Land Planning) a second phase of the scheme has been drawn up. In the Huhuni area of Njombe District the Wangingombe catchment area project was extended with the assistance of Water Development and Irrigation Department earth moving equipment; more small dams with associated soil conservation works were constructed in valleys adjoining the original scheme. A survey is being carried out on the Elton Plateau in order to draw up a plan for the proper utilisation of this important catchment area which feeds the rivers flowing into the Usangu plains where the Tanganyika Agricultural Corporation is proposing to develop 5,000 acres under irrigation as a pilot scheme in the Rufiji Basin project.





Loading cashew nuts at Mtwara Port. Cashew nuts have become a major export crop in coastal areas.



Hauling a blue nylon net aboard the Fisheries vessel "Mtembesi". Many local fishermen have purchased such nets after being shown their use by the Fisheries Officer.



A good rice crop grown under irrigation from a dam built by the farmer himself.



Sisal remains the major agricultural export of the territory. The photograph shows cut leaf being transported to the factory.



A typical scene in a cotton gin. The 1957 crop was a record one and severely taxed the capacity of the Lake Province ginneries.





Ex chief Simeon of Arusha watches his tractor returning from cultivation of his bean fields. His maize is already well up.

In the Lake Province an area in Busambiro Chieftdom in Geita has been prepared for settlement under closer agricultural supervision and with more intensive land planning than has been attempted in the past. The whole area has been divided into self contained holdings without any communal grazing. In the East Lake division so much attention is focused on the cotton crop that other important work tends to be overlooked. In every district, however, small projects for water conservation, gully stopping, grazing control, farm planning and similar measures are being successfully carried out and are beginning to rouse the enthusiasm of the local population for wider application.

In the Central Province there was a further drop in tribal turn-outs and works started two or three years ago still remained uncompleted; nevertheless some appreciable improvements in water supplies and contour banks were made. It is probable that there will be a lull of increasing inactivity for a year or two in this Province until the desire for self-help by small groups of farmers has been stimulated.

It must be recognised that conservation works carried out on a purely voluntary basis, whether on large farms or in village areas, are not generally very attractive propositions because they seldom show spectacular results and their full effect can only be appreciated over a period of several years. Unless they can be combined with an immediate and obvious objective, progress must inevitably be slow, especially as very few Africans can as yet look at soil and water problems through western eyes. When viewed in this light the achievements of the last few years, though appalling the pedant and the planner with their paucity, are nevertheless substantial.

## SECTION VIII

### IRRIGATION

Investigations into possible irrigation projects were intensified during the year and a system for co-ordinating effort on this type of work was devised. There are three limiting factors to the rapid development of major irrigation schemes in the Territory namely, high capital costs, lack of hydrological data over sufficiently long period, and the fact that many of the soils which can be brought under command are saline or alkaline. Experience elsewhere has shown that such soils can be very expensive to reclaim and additional capital expenditure of this nature on an extensive scale in the present state of the country's finances could only be undertaken to the detriment of irrigation schemes in more promising areas. It is admittedly possible to grow salt-tolerant crops where the degree of salinity is low, and it would be justifiable to accept the lower yields from such crops in cases where the saline soils formed only a small proportion of the total area. It is not justifiable to embark on schemes in which the preponderance of the soils require reclamation measures. Nevertheless an experiment station will have to be set up in a "problem" area of this nature as soon as funds and personnel can be made available so that, when the time eventually comes to develop these lands, the technique of reclamation will have been perfected.

Very encouraging progress in irrigation agronomy was made on all three of the trial farms established as part of the Rufiji Basin Survey. Not only did the staff familiarise themselves with irrigation techniques, but valuable data on which to base future cropping plans was also obtained. Crops showing great promise are cotton, kenaf and rice, while soya bean may prove well suited to off-season conditions.

At Ikowa and Mangoinyi, two sites in the Central Province where irrigation has been made possible from large dams, the department carried out trials with various crops during the year and at the former site prepared land on which a number of local farmers were permitted to grow groundnuts in order to obtain experience in managing irrigated crops. In general, the yields obtained from these trials during the usual planting season, while good, were no better than those obtained under favourable conditions without irrigation elsewhere in the territory. Off season planting of many crops, particularly at Ikowa, was not a success. While there is no doubt that irrigation can ensure good crops in the otherwise very chancy conditions which obtain in the Central Province, it has not as yet been shown that the gross returns obtainable are sufficient to carry the very high cost of providing the water and developing the land. Moreover, the water from the Mianji Mungaa dam which feeds the Mangoinyi scheme proved to be of doubtful quality for continued application on any but

very well drained land and there are fears that other storage dams in this arid province may show a similar tendency to become more saline as time passes. It also frequently happens that much of the land under command from the dams is already saline or alkaline.

At Mlali in the Eastern Province the people occupying the land made good use of the water for rice growing and for some vegetables and beans in the off season; the standard of cultivation is improving slowly. They are paying a small rate which hardly covers maintenance costs.

At Uru Chini in Moshi District there was little enthusiasm to take up plots in the irrigation scheme; but at the end of the year seven people had signed leases for plots of a reduced size. The plot operated by the Department on this scheme has demonstrated how to grow excellent crops of maize, castor and cotton with a minimum of irrigation; onions, chillies and tomatoes, which are grown under irrigation elsewhere in Moshi District, were also successful.

The most interesting development in irrigation, however, is the increase in the number of small dams in the Western Province which are built either communally or individually and each of which irrigates a small acreage of paddy. During the year, in Nzega District alone, 16 new dams were built communally bringing the total for the district up to 125. A large number of individual dams were built, 36 individuals being granted loans from a revolving fund operated by the Native Authority for this purpose. In Kahama District also about fifteen privately owned dams each capable of irrigating 2-3 acres have been constructed in addition to three large communal dams which brings the district total up to 50.

In the Northern Province, more non-native coffee growers put in overhead irrigation systems, and a start was made in the Southern Highlands. Competition for water in Arusha District is acute and the appointment of a water officer which was made towards the end of the year marks the beginning of an attempt to sort out the tangle of water rights which is an essential preliminary to further development there.

Fine crops of rice, averaging 3,800 lb. of paddy per acre, were again obtained from the small scheme at Malya.

## SECTION IX

### ANIMAL HUSBANDRY

As mentioned earlier in this report the functions of all herds maintained on departmental research stations and farms was reviewed in conjunction with officers of the Veterinary Department and an overall plan to fit in with the territorial breeding and livestock investigation policy was evolved.

On the large farm level the Agricultural Officer (Farms and Estates) in the Northern Province included advice on animal husbandry as one of his duties. In the Southern Province a Field Officer (Agriculture) with a strong mixed farming background was posted to Masasi where cattle are being introduced into a previously almost stockless area; his duties are to ensure that sound methods of animal management are brought into the farming system from the start. In the mountain areas of the Usambaras, Pares and Kilimanjaro, departmental staff, one of them being a lady Field Officer, were largely responsible for improving the care of stall fed animals.

## SECTION X

### MECHANISATION

Although all Government and Native Authority sponsored ploughing schemes have now been wound up, the Africans' desire to indulge in mechanical farming operations is in no way abated. In many of the areas where there had been Native Authority ploughing schemes various "ploughing societies" have been formed, the members of which subscribe sufficient capital to enable them either to make up the 25 per cent of purchase price required for a loan from the African Development Loans Fund or to make the down payment for machinery bought on a hire purchase agreement. The success of these societies has varied. Much depends on the leaders and their ability to organise the work of tractors on economical lines.



The Department has endeavoured to give guidance to these societies on the way in which they should organise their affairs and maintain their accounts. In the Rufiji a Field Officer with a mobile workshop was posted for a period of several weeks during the ploughing season in order to assist African tractor operators in maintaining their machinery in working order. A Field Officer has also been posted to Malya from where he endeavours to give advice and assistance to the considerable number of tractor operators in the Sukumaland area. In both these cases firms have co-operated in allowing these officers to hold stocks of fast moving spares for sale to tractor owners. In the Northern Province, where the arable areas are relatively concentrated and service facilities good, it has not been necessary for the Department to enter into the field of tractor maintenance directly. With the co-operation of the local agents, two courses of a week's duration each were held at Tengeru for operators of Fordson and Ferguson tractors.

The Government operated mechanised rice scheme at Lupiro was wound up after the 1957 harvest. Although 800 acres were ploughed ready for sowing, only 700 acres could be sown due to continuous rains towards the end of the season. Heavy floods in May and considerable game damage further reduced the harvested crop and the year's operations showed a substantial loss.

The reasons for abandoning this project were fourfold. In the first place it was often impossible to complete the requisite cultural operations on time owing to the vagaries of the weather and lack of water control; uncontrollable floods were also liable to cause extensive damage to the growing crop. Secondly no variety suitable to local conditions and also having the straw strength necessary for combining was discovered. Thirdly, under the local climatic conditions prevailing at harvest time, it was found that excessive "sun-cracking" of the grain occurred if the crop was not combined at the right critical stage. To obviate this difficulty it is either necessary to use an uneconomic number of combines or else to spread the harvest by planting several varieties of different maturation periods; the sowing of one variety at different times strangely enough did not appreciably affect the date of ripening. Finally conditions in the area did not permit the regular maintenance of electric fences, and game damage was severe. On the credit side, in addition to the negative experience outlined above, it can be claimed that valuable information has been obtained on the cultural operations necessary to obtain a good stand of rice, on the performance of various tractors and implements under the difficult conditions pertaining in reverine plains, and on the operation of rice combines.

An organisation known as the Tanganyika Agricultural Machinery Testing Unit has been set up at Malya in the Lake Province under the charge of a Senior Field Officer. Its aim is to find the best implements and mechanical aids for use by the peasant farmer. Machines and implements may be submitted to test either on departmental initiative or by commercial firms and all reports are confidential unless all parties concerned authorise publication. So far tests have been made or are in progress on castor shelling and cleaning machinery, ploughs, harrows, groundnut decorticators, ox carts, ox and hand-drawn cultivators, planters, treadle threshers and spraying machines. Investigations have also been carried out on the possibility of bulk handling of seed cotton. Another function of the Unit is to design, build and test prototypes in cases where standard machines are non-existent or inadequate.

No tractors or tractor-drawn machines will be tested at Malya except by special arrangement with the East African unit of the National Institute of Agricultural Engineering established at Nakuru in Kenya which deals with that aspect of machinery testing; full liaison was maintained with this organisation during the year.

In the central and northern inland belts of the Territory where there are high cattle populations increased attention was again given to the ox as a source of motive power. Departmental training stations both for oxen and their owners were satisfactorily but not enthusiastically patronised, and there was a steady demand for ploughs. The ploughing competition organised at Nzega brought out a very high standard on the part of the winners. Ploughing alone is not enough, and there is undoubted scope for the use of the ox with inter-row cultivation implements which would enable the very important first weeding

operation to be performed more expeditiously: this aspect is being followed up. The limiting factor to the greater use of ox carts is the high cost of imported models. In this connection a much cheaper type made in Zanzibar was imported for trial, and if its performance is satisfactory there should be no difficulty in finding local craftsmen capable of copying it.

## SECTION XI

### AGRICULTURAL EDUCATION

As indicated in last year's Report, a major revision of agricultural work in primary and middle schools was recently undertaken and further progress was made during 1957 in all provinces in implementing the new syllabus and in organising the production farms at certain middle schools where suitable land is available. A syllabus and a plan are, however, only starting points; their successful application depends entirely upon the keenness and outlook of the teacher. Agricultural training of teachers continued at the Agricultural Training Centre, Ukiriguru, at the Natural Resources School, Tengeru, and at Mahiwa in the Southern Province.

The Young Farmers' Club movement, which had been particularly strong in the Lake Province, reached a stage when it was apparent that the supervision of the various clubs tended to occupy too great a proportion of staff resources. There was also a tendency for the recreational side of the clubs' activities to become predominant. It has been decided not to encourage any increase in the number of such clubs attached to middle schools, as, with the development of middle school farms, school boys should obtain as much agricultural instruction as they can absorb. The vital need is to maintain and stimulate an interest in the land after the boys leave school. The co-operation of the Social Development Department in supervising the organisation of clubs outside the middle schools has therefore been sought and the department has undertaken to provide all the technical assistance required. Where a Social Development officer is available for such supervision the development of clubs will be encouraged.

Wami Farm School opened on January 11th with 11 pupils, all Asian. The aim of this school is to provide practical training for boys who will have the opportunity of taking up mechanised mixed farming on their own account after a further period of experience as managers or supervisors. Inevitably there were many teething troubles and some reorganisation of the staff and of the farming activities of the school will have to be undertaken. As a whole the pupils appeared reluctant to put their backs into the practical side of farm work, and could not appreciate the fact that a successful farmer must be able to perform any task as well as or better than his employees. Most of them were handicapped by having no previous farming experience, and were expecting to be trained more as estate agents than as farmers.

At Ukiriguru and Mahiwa, training courses in Swahili are designed for officers who have come into the Department by direct recruitment via the Subordinate Service. Fifty-one officers passed through these two organisations in 1957. At the Natural Resources School, Tengeru, the three-year course in English is designed as a pre-service training for boys of Standard VIII educational standard who intend entering the Agricultural Department as Field Assistants or Recorders. A review of this method of recruitment was undertaken during the year and it was decided that as from 1958 the qualification for entry into the Natural Resources School should be raised to Standard X and the course shortened to two years. A revised syllabus has been prepared for this new course. Twenty-eight students joined the department in January 1957 and 30 are expected early in 1958.

The Entomologist, Lyamungu, held some effective in-training courses on coffee pests for staff of all grades. At Bukoba the Agricultural Officer held a refresher course for all staff engaged in the West Lake area; the Director addressed this course by means of a tape recording, the effect of which was probably greater than if he had been present in person.

## SECTION XII

### GENERAL EXTENSION AND PROPAGANDA

The well appreciated difficulties of field extension work amongst widely scattered, largely illiterate and relatively primitive communities were mentioned in last year's report when it was stated that a "focal point" approach was being developed whereby staff concentrate on a particular aspect of agricultural work or on particular areas or individuals where it is hoped some response can be obtained fairly quickly. Every effort to divorce the Departmental staff from "policing" activities is also being made in order to promote the development of harmonious personal relationships between extension officers and the farmers.

The soundness of this method of approach is already apparent in many areas of the territory. Barriers of suspicion are breaking down and farmers are coming to ask for advice instead of passively waiting to receive it. One criticism of the method was that, by concentration of effort, the majority of farmers would be left outside the scope of departmental activity; this criticism is valid in the short term, but it is already clear that good news travels fast, and within the space of a year the outward movement from many focal points has begun. For example the number of cotton growers who registered their names to purchase dust in the Kilosa District focal points in 1957 was about 80; for 1958 the number exceeds 300. As the Assistant Director, Lake Province remarks, African farmers in general are becoming more individualistic and less afraid to be better than their neighbours. The next step is to work from the enterprising individual to his more backward neighbours. In the Kwimba District the approach has taken the form of an "old" farmers club which meets regularly with the local Field Officer to discuss topics of current interest; as a result joint conservation works have been undertaken and all the members are working their holdings to set plans.

Many examples could be quoted to show the results of successful extension work. For the sake of brevity only the most spectacular case is mentioned, namely the remarkable increase in the cotton crop in Maswa District from 10,300 bales in 1955 to 25,000 bales in 1957: this was largely achieved by the use of manure and tie-ridging on the sandy soils which were previously cultivated on the flat.

While the backbone of all extension work is the intimate contact between farmer and adviser, there are several more extensive methods of propaganda of which increasing use is being made. Agricultural Shows offer an opportunity of interesting a large number of people in a very short space of time and a striking departmental exhibit which attracts attention can be followed up by more personal contacts later. Departmental officers staged such exhibits at 14 Agricultural Shows which were held during the year in various parts of the territory; in many cases they also took a leading part in organizing such shows, but it is now accepted that this responsibility should be shouldered more and more by local unofficial initiative.

The printed word has not been neglected. The Young Farmers' Club newspaper, *Ukulima wa Kisasa*, continued publication throughout the year but it is likely to lose its identity as an exclusively agricultural paper in the near future. Many districts publish district newspapers which are a valuable medium for agricultural propaganda, and from Headquarters there has been a steady stream of press releases to both the African and non-African territorial newspapers and periodicals. *Baragumu*, the vernacular weekly paper, has proved the most useful channel for such material. Crop Reports and Crop Estimates are issued monthly; they find their way to Chambers of Commerce in all countries which trade with Tanganyika and to various trade papers.

Broadcasts from the Dar es Salaam radio "Voice of Tanganyika" formed a prominent part of the Department's propaganda activities and an apparently satisfactory technique has been evolved. Although the numbers of direct listeners may be relatively few, the spoken word on the radio evidently carries great weight amongst the peasants and several officers have reported that a sudden acceptance of certain advice previously scorned was due to the fact that it has been given out over the wireless and was, therefore, accepted as being the ultimate word of truth! A half-hour agricultural programme entitled "Hints on Agriculture"



was put out every Thursday during the year and various short notes were given in the programme "Your Province". On occasions recordings by prominent local personages were used in the programmes, and proved very effective.

District Extension Officers used various techniques of "put across" such as the running of courses on specific subjects, bush schools and cinematograph lectures. In the Usambaras the assistance of the Visual Aids Officer, Social Development Department, was enlisted to draw up a vigorous propaganda drive on the change-over from compulsory to persuasive methods. This pilot project in co-operation between the two departments should pave the way for similar ventures in the future.

One officer employed well-known local minstrels who are a feature of the social life of that particular district to compose ballads extolling the benefits of manuring, tie ridging, early planting and the like. It is reported that the current song hit which everyone goes about humming, goes somewhat as follows:—

Get up and out;

You lazy lout.

Stop drinking beer—or have bad luck;

Your fields are crying out for muck.

Whether this approach will have the desired effect on farm improvement remains to be seen but all propaganda avenues are worth exploring.

### SECTION XIII

#### INCREASED AGRICULTURAL PRODUCTIVITY

An appreciation that the increasing financial commitments inherent in expanding the social services for which all Africans are clamouring could endanger the economy of the country, led the African Members of Legislative Council to submit to the Governor a demand for a plan for increased agricultural productivity which, it was hoped, would raise the territory's financial resources so that increased social services could be carried without difficulty. As a result, district teams throughout the country, assisted by local influential Africans, prepared possible development schemes for consideration by their Provincial teams.

In drawing up these plans the agricultural policy frameworks which were formulated for every district in 1955 proved most useful and it is within these frameworks that the schemes for increased productivity have been made. The whole conception of an increased productivity plan for the territory has been of inestimable value, as it encouraged the Natural Resources Departments and the Provincial Administration to consider existing development policies objectively and to examine critically the disposition of existing staff and the use of available funds. This was evident from the number of schemes submitted based on existing staff being redeployed. Of even greater importance is the fact that interest has been aroused locally amongst the African cultivators and in many areas departmental staff and local farmers now feel that both are working towards the same ends.

In all, 140 schemes were submitted and following a critical examination by the Natural Resources Subcommittee of the Territorial Advisory Development Committee of Legislative Council an appreciable number were implemented immediately using existing staff and finance and a further 36 were selected to form the basis of an application for Colonial Development and Welfare assistance. Of these 29 are primarily agricultural development schemes, the detailed planning of which has been completed. Many Native Authorities and Local Governments have offered financial assistance, which varies according to the wealth of the district concerned, but in the poorer districts the whole cost will have to be borne by Central Government or by assistance received from the Colonial Development and Welfare Fund.

The aim of all these schemes is to enable the African farmers, through their own efforts, to increase the productivity of their present farming enterprises and to expand their activities so as to improve their standard of living. Prior attention has been given to medium and high value cash crops rather than to low priced or purely food crops because an attractive financial return to the farmer is likely to be the best incentive towards intensifying his efforts.

## SECTION XIV

### RESEARCH

Mention was made last year of the grant of a total of £222,616 from Colonial Development and Welfare Funds towards the cost of establishing adequate facilities for agricultural research in the territory. With the aid of this money four Regional Research Centres are being set up at Nachingwea in the Southern Province, Tengeru in the Northern Province, Ilonga in the Eastern Province and Ukiriguru in the Lake Province. Substations are being established in various ecological zones as funds and staff become available. In addition to these main Research Centres, Lyamungu Coffee Research Station and Mlingano Sisal Research Station carry out research on the two main export crops of the territory. These two stations are mainly financed by the coffee and sisal industries respectively. Apart from special crop investigations, the main line of research being followed is that of maintaining and improving soil productivity by means of manures, fertilisers, fallows, inter-cropping and crop succession with emphasis on those crops best suited to the respective local conditions. Promising new varieties of sesame, *Polysora* rust resistant maize, groundnuts, soya bean and castor have either been produced locally or introduced. Special attention is also being paid to research on irrigation agronomy on schemes run by the Department or by the Tanganyika Agricultural Corporation on behalf of the Rufiji Basin Survey. Very close co-operation has been maintained with research workers in the neighbouring territories and with the Research Organisations of the E.A. High Commission.

Detailed reports on the various investigations carried out during the year will be published in Part II of this report but the main work of the various Regional Centres during the year has been as follows:—

#### *Western Research Region*

*The main station, Ukiriguru*, is situated near Mwanza and is staffed by the Department of Agriculture and by the Empire Cotton Growing Corporation. The Lint and Seed Marketing Board makes a large contribution towards the recurrent expenditure. Cotton is the main crop being studied. Work continues on the general improvement of the U.K. strains of cotton and the incorporation into these, from other types of cotton, of resistance to the various forms of bacterial blight. The presence of *Fusarium* wilt in the Lake Province has been confirmed and a programme of survey and research will shortly begin in collaboration with the Empire Cotton Growing Corporation staff at Namulonge, Uganda. Research on sorghum breeding was suspended as the Botanist responsible has left the Department. General agronomic work on other crops, including grass, has been expanded. A study of the biology of the American Bollworm with particular reference to the invasion of the cotton crop from other crops and from local indigenous plants has begun.

*Urambo experiment station* has been taken over from the Tanganyika Agricultural Corporation. The two main programmes are concerned with tobacco on suitable soils and with general crops for the area.

*Mwanhala experiment station*. The first year of the new research programme was very successful and the work on the maintenance of soil productivity by means of manures, fertilizers and intercropping on local crops and on a new crop to the area, soya bean, will continue.

*Maruku experiment station*. Although Robusta coffee is the chief crop in the research programme of this station work is being done to see if it is possible to improve the productivity of a widespread local soil type, poor leached sand, in a comparatively short time, by means of fertilisers and by the growing of deep-rooted grasses and legumes.

#### *Northern Research Region*

*Tengeru Research Station* is situated outside Arusha. Two plant breeding programmes have been started: one to produce a short-term maize variety for areas of low and erratic rainfall: the other to produce a short-term rust resistant wheat. A sub-station at West

Kilimanjaro has been established in connection with the latter project. Research on the control of the many insect pests attacking castor has begun. A Land Planning Officer is stationed at Tengeru.

### *Central Research Region*

*Ilonga*, the main station in this region, is situated near Kilosa. It is financed and staffed on the same lines as Ukiriguru. A multi-strain variety of cotton produced there is showing great promise as regards yield, Jassid resistance and lint characteristics; bulking up for general distribution will begin in 1958. Work continues to find a spraying programme utilizing the minimum amount of insecticides to give good control of insect pests of cotton. Two programmes of castor breeding have been started, one accepting the necessity of a spraying programme for pest control, the other searching for insect resistant factors for incorporation into suitable high yielding varieties.

The general agronomic programme includes studies on intercropping, the inter relationships of rainfall, plant population and time of planting on yield; soil management problems, groundnut varieties and the growing of soya beans as a commercial crop.

A number of sub-stations covering a wide range of soils and climates are attached to the centre.

*Coast Experiment Station, Chambezi.* The main crop here is coconut. Fertiliser trials on adult palms have been started and also a study on the control of a bug causing premature nut fall. Agronomic work on a wide range of crops is also in progress.

### *Southern Research Region*

*Nachingwea* is the main station in this region. A new experimental farm containing a number of important local soil types has been taken over and new laboratories are almost complete.

The work on the maintenance and improvement of soil productivity includes a study of the important problem of the bush fallow and of other types of fallow in an attempt to elucidate how they produce their effects and to see if other methods of maintaining productivity are as effective or better than the traditional systems.

The plant breeding programme includes work on soya bean, sesame, sorghum and cashew. On the last crop an investigation is being made on the biology of its insect pests.

A few substations are attached to this centre and others are planned. The soil surveys of potential irrigation areas in the Rufiji Basin are undertaken from this centre.

### *Entomological Research—General*

In addition to the problems mentioned above work is in progress or is planned on:

- (a) Leaf miners of coffee.
- (b) Coffee berry borer.
- (c) Control of chafer grubs on pyrethrum (Arusha).
- (d) Termites damaging standing crops.

### *Plant Pathological Research—General*

The following are the main lines of investigation in hand:

- (a) An investigation into the causal agent of the disease known as stem pitting of coffee, in collaboration with the East African Agricultural and Forestry Research Organisation. Also surveys of the distribution of the disease and estimates of the damage caused.
- (b) A detailed study of the etiology and control of Coffee Rust.
- (c) Control of tobacco anthracnose.
- (d) The cause of "oily pod" in beans.



## SECTION XV

### FISHERIES

The Fisheries Division of the Department suffered considerably from staff shortages during the year. The Fisheries Officer (Headquarters) was on vacation leave from August onwards and the Fisheries Officer, Malya was absent on leave on urgent private affairs for four months. Only the Marine Fisheries Officer, stationed at Pangani, was on duty throughout the year. A new Fisheries Officer has been recruited and after a short training course is expected to arrive in the Territory early in 1958. For the first time for four years the establishment of the Fisheries Division will then be complete.

That much useful fisheries development work has been accomplished with little direct guidance from the Fisheries Officers has in the main been due to the keenness and devotion to duty of the African Field Staff of the Division and to real enthusiasm and support for fisheries work shown by provincial and district agricultural staff.

The Marine Fisheries Officer was stationed at Pangani throughout the year, but toured the whole of the coastline including Mafia Island.

The Fisheries Officer stationed at Malya is concerned with the investigation and development of dam fisheries. His activities during the year were confined to the Lake Province although other Provinces were assisted with supplies of fish fry.

The administrative and advisory duties of the Fisheries Officer stationed at Headquarters included much work on Increased Productivity Proposals this year. Before his departure on leave he had toured in the Lake, Northern, Southern, Tanga and Western Provinces, as well as representing the Territory at meetings of the Lake Victoria Fisheries Board held at Kisumu and Entebbe.

Fisheries policy remains unchanged viz: the development of the existing coastal and inland fisheries by extension methods with the emphasis on the focal point approach and the development of new fish resources with the emphasis on the stocking of dams and water impoundments primarily constructed for other purposes.

#### *Marine Fisheries*

The results of extension work carried out from the Marine Fisheries Base have amply justified the choice of Pangani as a site for concentrated work by the focal point approach. This method is particularly suited for work amongst the coastal fishermen, many of whom are migratory and thereby help to diffuse new techniques. In addition to this natural spread of ideas from the focal point, the Marine Fisheries Officer has energetically extended successful results at Pangani by wall displays at selected fishing villages elsewhere, by articles in the vernacular press and by news-flashes and talks on the Swahili programmes of the Tanganyika Broadcasting Corporation.

"Mtembezi", the 22-foot wooden Danish fishing boat powered by semi-diesel engine, referred to in last year's report, was commissioned in January and was in service throughout the year. She has been used for a wide variety of experimental inshore fishing, for demonstration of fishing gear at villages on the Tanga Province coast and for training African fisheries staff and selected local fishermen. "Mtembezi" is an inshore vessel and the main criticism that the Marine Fisheries Officer has of her is that she is on the small side for the variety of tasks that he would like to perform. In particular it is not considered advisable to risk this vessel on long coastwise passages under her own power and the use of "Mtembezi" in Southern Province waters would require that she be transported there by steamer.

The "Mtembezi" has aroused considerable interest amongst both African and non-native (e.g. Arab) fishing communities in the area. In spite of the relatively low purchase price and operating costs of this vessel when considered against those of other powered fishing vessels of comparable size, there is little sign that African fishermen are prepared as yet to accept the responsibility of purchasing and operating such a craft with the aid of loan funds. There is however an awakening interest in mechanisation which is mainly manifesting itself in the purchase of outboard engines for fitting to existing craft although one Arab fisherman has this year invested in a 15 h.p. diesel for installation in a 30-foot mashua.

As stated in last year's report, the initial emphasis of our experimental fishing programme and extension work was to be on the development of a shark fishery and very considerable results have now been achieved in this direction. Good stocks of sharks exist, there is a large and steady demand for dried shark flesh and, as the fishermen receive a price of around 50 cents per lb. for fresh shark, the rewards can be considerable by local standards in view of the fact that the capture of sharks of over 100 lb. in weight is not uncommon.

At first, trials were carried out with set lines of large shark hooks. Although fair catches were made by this method it has various disadvantages for operation by local crews, not the least being the regular provision of suitable bait. Work was then switched to shark set (tangle) nets. The net now used is made of a blue-grey shade of 210/36 ply nylon, of 6 inches stretched mesh, 55 meshes deep, 80 fathoms long unmounted. Such a net when fully rigged with lines, floats, leads, etc., costs around Shs. 2,000/- to put in the water. Experimental fishing with this net in the Pangani area was outstandingly successful. Sharks ranging in weight from 2 lb. to 530 lb. each, as well as a few fish of other types, were caught and held with little damage to the fabric of the net. In a 30-day fishing period catches averaged 200 lb. per day and gross earnings for the period were Shs. 2,500/-.

Immediate interest was aroused amongst local fishermen. Our first net was loaned to a local crew who, fishing under our supervision, grossed Shs. 1,352/- in 25 days. A substantial part of this sum was then deposited towards purchase of a net of their own, the balance being obtained by a loan from the African Productivity Loan Fund.

At the end of the year nine of these nets were in operation in the Tanga-Pangani area, loan applications for eight more had been forwarded and demands for another twenty or so are known to exist. Although adequately proven that the purchase price of one of these nets is rapidly recoverable and is then followed by substantial profits, it is nevertheless a formidable sum for the average fisherman to find. This is where the loan funds administered by the African Development Loan Committee have been particularly useful although too often the security offered by applicants is inadequate to meet the requirements of the Committee.

The net trade has been keenly interested in these developments but such nets have been in short supply and the limited numbers available to the East African market were depleted during the year to cope with a shark scare at Natal holiday resorts. As a result of increased landings of shark it has been worthwhile for private enterprise to open a drying station at Pangani where all sharks are purchased at Shs. 1/- per kilo wet weight.

Developments with the nylon shark net are now being extended to the Southern Province. A Fisheries Assistant, trained at Pangani, is stationed at Mtwara with a net purchased by the Mtwara Native Authority. This is demonstrated from various native craft the owners of which retain a portion of the money obtained from sale of catches, the balance going to the Native Treasury. Operations started in December and catches to the value of Shs. 500/- were obtained for twelve shots with the net. Loan applications for the purchase of such nets by Southern Province fishermen are now coming forward. Lindi Native Authority are to finance the purchase of a net and are sending a man to Pangani for training.

A wide range of other experimental fishing, of experimental construction of fishing gear and experiments in preservation and utilisation of fisheries products has been carried out at Pangani. Of especial interest were experiments carried out with a small home-made beam trawl for the capture of prawns. These have shown that there are clear grounds in Pangani Bay for the operation of such gear and that prawns, as well as edible fish, can be taken by it although not yet in sufficient quantities to recommend commercial development. A final verdict on this project must await work with a larger beam-trawl just obtained from the United Kingdom and fishing on these grounds at various seasons of the year.

The Marine Fisheries Officer has made a special study of fish marketing problems in the Tanga Province and has been able to advise various authorities on improvements to existing methods.

The powers of the Game Warden to licence the capture of green turtles under the Fauna Preservation Ordinance have been delegated to the Marine Fisheries Officer. As a result, a Kenya firm operated in the waters of Tanga Province for a short season this year, capturing some twenty of these interesting marine creatures, each weighing around 200 lb. Apart from the demand for the ingredients for the soup traditionally associated with civic banquets, there is a great demand for turtle oil by the cosmetics industry. Two of the Tanganyika specimens were flown alive to Europe for display in Zoological Gardens.

#### *Inland Fisheries*

The "dagaa" fisheries of Lake Tanganyika continued to flourish and exports passing through Kigoma were recorded at 2,264 tons, including 294 tons exported to Lake ports in Belgian territory. Production appears to have been well maintained in Kigoma District, with a possible falling off in exports from Mpanda and Ufipa Districts. Figures for output of fisheries products which are not sold through native produce markets are at all times difficult to estimate. In the case of Lake Tanganyika this situation is complicated by the fact that there are evidently considerable unrecorded sales and exports to avoid the payment of the Native Authority cess which is levied on dried dagaa at the time of export.

The great importance of the dagaa fisheries in the economy of the lakeshore Districts of the Western Province, coupled with a knowledge that the dagaa stocks are far from being fully cropped, have led to the preparation of an Increased Productivity Plan for this industry. This envisages the full-time employment of a Field Officer (Fisheries) for the introduction of improved methods of catching, preservation and marketing of the dagaa crop. Approval has been given to this scheme which it is hoped to launch early in 1958.

1957 was a year in which a fair level was maintained by the very shallow waters of Lake Rukwa and good fishing has been reported. The year was marked by the re-entry of European enterprise into the industry and by the registration of an African Co-operative Fish Marketing Society which is due to begin full trading activities on March 1st, 1958. It is to be hoped that this canalization of marketing will enable some assessment of the current output of this valuable fishery to be made as reliable figures for recent years are entirely lacking.

The many minor inland fisheries on rivers, swamps, small lakes and dams are assuming an increasing importance in the economy of the districts in which they occur and are making a valuable contribution to protein supplies, particularly in those areas more remote from the coast and the larger lakes. The Departmental policy of stocking suitable waters and of giving encouragement and assistance in their fishing is now producing useful results. A typical example is Lake Rutamba in Lindi District, which, formerly producing only a few catfish, now supports a healthy *Tilapia* fishery employing fifteen full-time fishermen and exporting smoked fish to other parts of the Southern Province.

Where stocking and management practices on some of the minor "lakes" and the larger dams have resulted in the build-up of stocks sufficient to maintain a regular net fishery, such waters often attract alien netting experts from far afield. Two such cases are the long established fishery on Lake Babati, Mbulu District which was re-stocked during the year, and the newly created fishery on Mianji Dam, Singida District, now supporting some thirty full-time fishermen. Included amongst the fishermen who have settled in these areas are some from the Nyanza Province of Kenya, from Nyasaland and from the Belgian Congo. Their catches are disposed of locally and whilst in the main the locals are content to benefit from their skills at secondhand there is now some sign that the younger generation are anxious to learn their methods.

On the other hand, the stocking of smaller and more seasonal dams, hafirs, etc., has frequently led to the enthusiastic adoption of fishing by the local inhabitants, often in areas where there is little tradition or experience of the art. In many instances quite useful yields of fish are being obtained by simple hook and line fishing. There have been particularly



good results from the large stocking programme undertaken in the Central Province. For instance, it is reported that fishing is now one of the major occupations of the people living in the vicinity of six dams stocked in Manyoni District.

The presence of several minor fisheries of importance in areas adjacent to the Central Railway Line, e.g., the Malagarasi Swamps of the Western Province, the Bahi Swamps of Central Province and the river systems of the Wami, Ruvu and the tributaries of the Rufiji in Eastern Province, together with fisheries developments arising from dam stocking in this areas, have led to the formulation of an Increased Productivity Plan for the development of fisheries along the Central Line. The scheme envisages a full-time Field Officer (Fisheries), based on Dodoma, who will organize stocking where required and will assist with the introduction of, and instruction in the use of, improved methods of fishing, curing and fish marketing in the fisheries of the Central Line area. Approval has been given to this plan which it is hoped to implement early in 1958.

The problems concerned with the right species of fish to stock in certain dams, with the management of dams for the optimum production of fish and with suitable methods for fishing them, are being studied by the Fisheries Officer, Malya. At the Malya station there is a large and long-established dam which is used for trials with various types of fishing gear and a series of ponds which are used for building up stocks of fry and fingerlings for distribution elsewhere. In connection with the Malya programme, a large number of dams of varying types were stocked and/or fished in the Sukumaland Districts of the Lake Province during the year. But for the unexpected departure of the Fisheries Officer, this work would have been extended to the Unyamwezi Districts of Western Province during the year and, with his return, arrangements are now in train for this to take place.

Of particular interest are the data now accumulating regarding the "self-stocking" of certain indigenous species of fish which enter dams during flood periods. On the credit side, some dams are now yielding economic quantities of self-stocked "ningu" (*Labeo* spp.), a popular food fish. On the debit side, much trouble is caused in some dams in the Lake Victoria and Lake Eyasi drainage areas by the entry of Lungfish (*Protopterus* spp. Swah. "Kambale mamba"). This fish, which frequently attains weights of 7 lb. and more, causes much damage to economic species of fish when meshed in gill nets as well as damaging the nets themselves. Although this fish is the subject of valuable economic fisheries elsewhere e.g. Lake Kioga, Uganda, unfortunately it is not acceptable as food to the Wasukuma. For this reason, although it can be removed from dams quite effectively by fishing with extra strong hooks, there is little incentive to do so.

The department was very closely associated with the stocking and fishing of the dams at Messrs. Williamsons Diamonds Ltd., at Mwadui. Excellent progress has been made with these fisheries. The mine is virtually self-supporting for fish supplies and a full-time European employee is now engaged on fishing operations both on the Williamson Dams and, by arrangement with Alamasi Ltd., on the very productive dam at the nearby Alamasi Mine. Williamson's new 600-acre Nhumbu Dam, stocked in February, is just now coming into production. The first fishings of this dam in December yielded over 1,700 lb. of fish which included 1,100 *Tilapia* of  $\frac{3}{4}$  lb. weight and over. Although not all dams were fished throughout the year and fishing intensity has varied from month to month, Williamson's total catch for the year amounted to 20,400 lb. of fish. A great debt is owed to Messrs. Williamson's for making their very detailed fishing statistics, including costings, available.

Fish culture, in the sense of fish farming on the classic model involving the use of specially constructed drainable ponds, for rearing fish for market, no longer forms part of the Departmental programme. The ponds operated by the Department are used exclusively for the production of fry and fingerlings for stocking dams, etc. There has however been a decided movement in Songea District for the construction of small, simple non-drainable farm ponds in which *Tilapia* fingerlings are fattened for home consumption. Some four hundred of these ponds are now in existence and the Fisheries Assistant stationed at Songea is fully occupied in advising on choice of sites and construction of ponds and in the provision of stocking material.

## SECTION XVI

### LEGISLATION

The most important legislation affecting agriculture which was promulgated during the year was as follows:—

#### A.—Ordinance:

The Coffee Industry Ordinance, 1957, was enacted on 10/10/57. This ordinance repealed and consolidated the Coffee Industry (Registration and Improvement) Ordinance, the Coffee Factories Ordinance and the Coffee (Tax) Ordinance, and revised the provisions of these ordinances in the light of experience. Provisions relating to the registration of plantations and nurseries have been omitted entirely from the new ordinance and the licensing system in respect of dealers, processors and exporters of coffee has been revised.

#### B.—Rules and Regulations:

The Cotton Rules, made under Section 47 of the Cotton Ordinance, were published on 14/6/57. These rules provide *inter alia* for:—

The storage and distribution of cotton seed.

The registration of cotton buyers.

The packing and weighing of seed cotton.

The storage of seed cotton.

The regulation of ginning.

The grading of lint.

The Plant Protection (Compulsory Fumigation of Imports) (No. 2) (Amendment) Order 1957 published on 16/8/57 revoked the schedule to the Order made in 1956 and made it compulsory for all grains, flours, edible oil seeds, pulses and beans from India, Pakistan, Burma, Siam and all territories in the Arabian Peninsula and those bordering the Persian Gulf and Red Sea, Portuguese East Africa and the Central African Federation to be fumigated: also secondhand gunny bags from any countries other than Kenya and Uganda, Green Ginger from all territories other than Kenya, Uganda and Zanzibar and also malt from the United Kingdom, Northern Ireland and Eire.

The Plant Protection (Compulsory Fumigation of Imports) (No. 2) (Amendment) (No. 2) Order, 1957 published on 8/11/57 provided authority to require any article which was found, or was reasonably suspected, to be infected with a scheduled pest or disease to be fumigated or suitably treated. It also provided for the fumigation or treatment of vessels, vehicles, aircraft and buildings which had been used for the conveyance or storage of articles infested or suspected of being infested with a scheduled pest or disease.

## SECTION XVII

### BOARDS AND COMMITTEES

The following appointments were held by members of headquarters staff:—

#### Director:

Member of Legislative Council.

#### Chairman:

Lint and Seed Marketing Board (from 11th October, 1957).

Cotton Board.

Coffee Board.

Seeds Board.

Wami Farm School Advisory Committee.

*Member:*

Tea Board.  
Pyrethrum Board.  
Maize Advisory Committee.  
Central Advisory Committee on Nutrition.  
African Loans Advisory Committee.  
Governing Body, Tea Research Institute of East Africa.  
Technical Co-ordinating Committee, (E.A.H.C.) Agriculture.  
Technical Co-ordinating Committee, (E.A.H.C.) Animal Industry.  
Technical Co-ordinating Committee, (E.A.H.C.) Marine Fisheries.  
Roads Advisory Committee.  
Rufiji Basin Survey Advisory Committee.

*Deputy Director:*

Member—Board of Tanganyika Agricultural Corporation.  
Member—Working Party on St. VIII Leavers.  
Member—Mkata Ranch Management Committee.

*The Assistant Director:*

Member—Milling Board.  
Member—Council for the Blind.  
Member—Temeke Dairy Management Committee.

## SECTION XVIII

### STAFF

The Director, Mr. J. R. P. Soper, was in charge of the Department throughout the year. There were no changes in officers holding superscale posts.

Six Agricultural Officers left the Department, one on transfer and five on resignation. One of the latter was Mr. A. S. Fundikira who had just recently been promoted from Assistant Agricultural Officer. He resigned in order to take up the chieftainship of his tribe. Two Agricultural Officers arrived on transfer from other territories and seven Agricultural Officers joined the Department on probation, six having received post graduate training at the Imperial College of Tropical Agriculture, Trinidad.

One Botanist left the Department on transfer to the East African Agriculture and Forestry Research Organization and one Botanist, one Entomologist and one Plant Pathologist joined the Department. One Chemist on secondment from the Government Chemists Department resigned and one Chemist was appointed to the Department but was immediately seconded to the Rufiji Basin Survey.

Five Assistant Agricultural Officers or Scientific Assistants joined the Department after obtaining their Diplomas at Makerere. One Office Assistant was appointed Assistant Agricultural Officer. One Assistant Agricultural Officer left to study further in the United Kingdom.

Eight Field Officers and one Agricultural Foreman left the Department for various reasons and ten new Field Officers joined the Department. Eight Field Officers previously employed by the Development Organization were taken in to the departmental establishment on 1st July, 1957. One Field Officer was promoted to Senior Field Officer.

For the first time a substantive full-time secretary was appointed to the department thus releasing an Agricultural Officer who has been filling the post for several years.

The staff position as at 31st December, 1957, is shown in the following table:—



*Staff Position as at 31.12.57 (not including those on leave pending retirement, resignation and transfer)*

| Post                                                                | Establishment | Strength        | Vacancies |
|---------------------------------------------------------------------|---------------|-----------------|-----------|
| Director ... ..                                                     | 1             | 1               | —         |
| Deputy Director ... ..                                              | 1             | 1               | —         |
| Chief Research Officer ... ..                                       | 1             | 1               | —         |
| Assistant Directors ... ..                                          | 4             | 4               | —         |
| Senior Research Officers (A) ... ..                                 | 2             | —               | 2         |
| Senior Research Officers (B) ... ..                                 | 2             | 2               | —         |
| Senior Botanist ... ..                                              | 1             | —               | 1         |
| Agricultural Officers ... ..                                        | 60            | 57 <sup>#</sup> | 3         |
| Fisheries Officers... ..                                            | 4             | 4 <sup>†</sup>  | —         |
| Entomologists ... ..                                                | 4             | 4               | —         |
| Plant Pathologists ... ..                                           | 4             | 3 <sup>‡</sup>  | 1         |
| Botanists ... ..                                                    | 3             | 3               | —         |
| Plant Physiologist ... ..                                           | 1             | 1               | —         |
| Horticulturist ... ..                                               | 1             | 1               | —         |
| Chemists ... ..                                                     | 5             | 2§              | 3         |
| Surveyors ... ..                                                    | 4             | —               | 4         |
| Master, seconded from Education Department ... ..                   | 1             | 1               | —         |
| Zoologist ... ..                                                    | 1             | 1               | —         |
| Secretary ... ..                                                    | 1             | 1               | —         |
| Treasury Accountant seconded from Accountant-General's Dept. ... .. | 1             | 1               | —         |
| Assistant Scientific Officers ... ..                                | 4             | 1               | 3         |
| Master ... ..                                                       | 1             | 1               | —         |
| Senior Field Officers (Agric.) ... ..                               | 9             | 9               | —         |
| Tobacco Officers ... ..                                             | 2             | 2               | —         |
| Ginnery Officer ... ..                                              | 1             | —               | 1         |
| Coffee Grader ... ..                                                | 1             | 1               | —         |
| Mechanical Instructor ... ..                                        | 1             | 1               | —         |
| Office Superintendent ... ..                                        | 1             | 1               | —         |
| Field Officers (Agric.) ... ..                                      | 107           | 94              | 13        |
| Assistant Agricultural Officers ... ..                              | 13            | 9               | 4         |
| Agricultural Foremen ... ..                                         | 6             | 5               | 1         |
| Office Assistants ... ..                                            | 4             | 4               | —         |
| Accounts Assistants ... ..                                          | 3             | 2               | 1         |
| Research Assistant ... ..                                           | 1             | 1               | —         |
| Warden ... ..                                                       | 1             | 1               | —         |
| Personal Secretaries/Stenographers ... ..                           | 7             | 7               | —         |
| Clerks Upper Division ... ..                                        | 26            | 26              | —         |
| Clerks (General Division/subordinate service), Group A ... ..       | 111           | 106             | 5         |
| Assistant Field Officer ... ..                                      | 1             | 1               | —         |
| Senior Field Assistants ... ..                                      | 8             | 4               | 4         |
| Field Assistants ... ..                                             | 472           | 402             | 70        |
| Agricultural Instructors subordinate service, Group C ... ..        | 1,022         | 872             | 150       |
| Senior Farm Bailiffs ... ..                                         | 2             | 1               | 1         |
| Farm Bailiffs ... ..                                                | 8             | 5               | 3         |
| Junior Farm Bailiffs ... ..                                         | 6             | 6               | —         |
| Chemical Assistants ... ..                                          | 2             | 1               | 1         |
| Coffee Grading Assistants ... ..                                    | 3             | 2               | 1         |
| Recorders ... ..                                                    | 22            | 12              | 10        |
| Junior Recorders ... ..                                             | 72            | 49              | 23        |
| Recorder Assistants/Senior Recorder Assistants ... ..               | 51            | 51              | —         |
| Medical Assistant ... ..                                            | 1             | —               | 1         |
| Artisans ... ..                                                     | 5             | 5               | —         |
| Laboratory Assistants ... ..                                        | 2             | 2               | —         |
| Laboratory Auxiliaries ... ..                                       | 10            | 5               | 5         |
| Motor and Tractor Drivers ... ..                                    | 2             | 2               | —         |
| Telephone Operator ... ..                                           | 1             | 1               | —         |
| Subordinate Service Staff (various) ... ..                          | 203           | 199             | 4         |
| Fisheries Assistants ... ..                                         | 8             | 4               | 4         |
| Fisheries Guards and Senior Fisheries Guards ... ..                 | 18            | 5               | 13        |
| Coffee Grading Auxiliaries ... ..                                   | 8             | 7               | 1         |

NOTES:

\*Includes 10 Agricultural Officers allocated to Department, not yet arrived.

†Includes one Fisheries Officer allocated to Department, not yet arrived.

‡Includes one Plant Pathologist allocated to Department, not yet arrived.

§Includes one Chemist allocated to Department, not yet arrived.

||Seconded from Government Chemists Department.

## SECTION XIX

### CONCLUSION

In conclusion I wish to extend my warmest thanks to all members of the department for their enthusiasm and loyalty during a year of great progress. I also wish to thank all those members of the public who have given unstintingly of their time and energy in furthering the aims of the department.

J. R. P. SOPER,  
*Director of Agriculture*

MONTHLY RAINFALL IN INCHES FOR SEASON 1956/57 AND YEAR 1957  
AT PROVINCIAL STATIONS

|                  | Morogoro |              | Dodoma |              | Tabora |              | Mwanza |              | Mbeya |              | Arusha |              | Tanga |              | Mtwara |              |
|------------------|----------|--------------|--------|--------------|--------|--------------|--------|--------------|-------|--------------|--------|--------------|-------|--------------|--------|--------------|
|                  | Ins.     | Average Ins. | Ins.   | Average Ins. | Ins.   | Average Ins. | Ins.   | Average Ins. | Ins.  | Average Ins. | Ins.   | Average Ins. | Ins.  | Average Ins. | Ins.   | Average Ins. |
| October, 1956    | 0.21     | 0.97         | 0.00   | 0.18         | 0.55   | 0.36         | 4.11   | 1.33         | 0.00  | 0.54         | 0.06   | 0.37         | 1.28  | 6.01         | 1.28   | 1.09         |
| November, 1956   | 1.47     | 2.06         | 0.00   | 0.84         | 1.55   | 1.48         | 1.65   | 3.94         | 2.43  | 2.14         | 1.70   | 1.73         | 5.01  | 6.01         | 0.06   | 1.30         |
| December, 1956   | 1.59     | 2.83         | 5.79   | 3.86         | 7.86   | 6.45         | 4.89   | 6.49         | 6.94  | 5.37         | 1.96   | 3.12         | 1.65  | 2.71         | 4.71   | 7.45         |
| January, 1957    | 4.01     | 3.79         | 4.60   | 5.82         | 7.05   | 5.98         | 5.11   | 3.26         | 12.13 | 7.67         | 6.84   | 2.62         | 3.83  | 0.65         | 5.93   | 10.20        |
| February, 1957   | 3.86     | 4.04         | 4.20   | 4.15         | 4.91   | 3.99         | 3.42   | 2.92         | 9.66  | 6.35         | 3.00   | 2.59         | 0.56  | 1.46         | 4.69   | 5.79         |
| March, 1957 ...  | 5.97     | 6.62         | 2.42   | 4.98         | 7.00   | 7.05         | 5.01   | 5.50         | 3.65  | 6.12         | 1.96   | 1.58         | 2.19  | 3.67         | 5.82   | 6.02         |
| April, 1957 ...  | 7.40     | 8.20         | 4.90   | 2.08         | 6.41   | 4.47         | 6.76   | 6.19         | 4.83  | 4.70         | 16.57  | 7.49         | 13.85 | 9.83         | 8.34   | 7.58         |
| May, 1957 ...    | 4.74     | 3.97         | 0.47   | 0.22         | 0.28   | 1.56         | 7.18   | 3.41         | 0.39  | 0.71         | 6.78   | 4.08         | 20.94 | 12.40        | 1.60   | 2.31         |
| June, 1957 ...   | 0.05     | 1.06         | 0.00   | 0.04         | 0.00   | 0.00         | 1.04   | 0.43         | 0.00  | 0.05         | 0.15   | 0.20         | 2.52  | 1.73         | 0.01   | 0.42         |
| July, 1957 ...   | 0.39     | 0.53         | 0.00   | 0.00         | 0.00   | 0.00         | 0.00   | 0.89         | 0.00  | 0.03         | 0.36   | 0.19         | 3.29  | 2.06         | 1.29   | 0.41         |
| August, 1957     | 0.19     | 0.36         | 0.00   | 0.00         | 0.00   | 0.00         | 0.00   | 0.91         | 0.00  | 0.05         | 0.01   | 0.29         | 2.37  | 3.50         | 0.78   | 0.32         |
| September, 1957  | 2.56     | 0.64         | 0.00   | 0.06         | 0.36   | 0.43         | 0.73   | 1.55         | 0.05  | 0.10         | 0.14   | 0.10         | 3.74  | 3.69         | 0.17   | 4.71         |
| Total for Season | 32.44    | 35.05        | 22.38  | 22.23        | 35.97  | 31.77        | 39.90  | 36.82        | 40.08 | 33.83        | 39.53  | 24.36        | 61.23 | 53.72        | 34.68  | 47.60        |
| October, 1957    | 0.95     | 0.93         | 0.00   | 0.17         | 0.90   | 0.40         | 1.71   | 1.73         | 0.01  | 0.52         | 1.12   | 0.30         | 2.97  | 5.34         | 0.44   | 1.13         |
| November, 1957   | 2.52     | 2.05         | 0.09   | 0.80         | 0.71   | 1.49         | 4.66   | 3.61         | 0.67  | 2.15         | 5.86   | 1.72         | 7.70  | 5.87         | 0.64   | 1.05         |
| December, 1957   | 2.02     | 2.80         | 4.55   | 3.92         | 7.81   | 6.73         | 8.18   | 6.26         | 5.83  | 5.43         | 9.28   | 2.83         | 2.74  | 2.56         | 17.38  | 6.90         |
| Total for 1957   | 34.66    | 34.99        | 21.23  | 22.24        | 35.43  | 32.10        | 43.80  | 36.66        | 37.22 | 33.88        | 52.07  | 23.99        | 66.70 | 52.76        | 47.09  | 6.84         |



## CROP PRODUCTION FIGURES

## MAJOR CROPS

## SISAL

| Year |     |     | Production<br>in tons |     | Export<br>in tons |     | Value of<br>Export in £ |
|------|-----|-----|-----------------------|-----|-------------------|-----|-------------------------|
| 1953 | ... | ... | 168,763               | ... | 171,151           | ... | 12,773,839              |
| 1954 | ... | ... | 178,250               | ... | 167,642           | ... | 10,902,109              |
| 1955 | ... | ... | 176,499               | ... | 173,676           | ... | 9,956,151               |
| 1956 | ... | ... | 185,762               | ... | 186,867           | ... | 10,899,678              |
| 1957 | ... | ... | 184,877               | ... | 181,815           | ... | 9,481,514               |

## COFFEE

## Mild Coffees

## Tons of clean coffee

| Province           |     | Area                      | 1953/54 | 1954/55 | 1955/56 | 1956/57 |
|--------------------|-----|---------------------------|---------|---------|---------|---------|
| Northern           | ... | K.N.C.U. ...              | 6,600   | 4,450   | 6,660   | 5,800   |
|                    | ... | Warusha ...               |         | 125     | 182     | 100     |
|                    | ... | Wameru ...                |         | 184     | 369     | 200     |
|                    | ... | Estates (Non-native)      | 1,520   | 2,200   | 2,880   | 3,250   |
| Southern Highlands | ... | Rungwe ...                | 452     | 780     | 385     | 1,100   |
|                    | ... | Mbeya/Mbozi (Native) ...  | 180     | 122     | 116     | 200     |
|                    | ... | Mbeya/Mbozi (Estates) ... | 170     | 147     | 164     | 150     |
|                    | ... | Lupembe ...               | 4       | 12      | 29      | 17      |
| Southern Tanga     | ... | Songea ...                | 236     | 390     | 490     | 500     |
|                    | ... | Pare ...                  | 83      | 103     | 103     | 100     |
|                    | ... | Lushoto ...               | 93      | 150     | 140     | 150     |
|                    | ... | Estates ...               | 35      | 83      | 61      | 50      |
|                    |     |                           | 9,373   | 8,746   | 11,579  | 11,617  |

## Hard Coffees

## Tons of clean coffee

| Province:   | 1953/54 | 1954/55 | 1955/56 | 1956/57 |
|-------------|---------|---------|---------|---------|
| Lake ...    | 7,230   | 8,627   | 9,144   | 10,200  |
| Tanga ...   | 33      | 30      | 29      | 50      |
| Eastern ... | 55      | 51      | 331     | 400     |
|             | 7,318   | 8,708   | 9,504   | 10,650  |

## COTTON

## Production in Bales of 400 lb.

| Province     | 1953   | 1954    | 1955    | 1956    | 1957    |
|--------------|--------|---------|---------|---------|---------|
| Lake ...     | 38,600 | 90,859  | 108,843 | 121,304 | 151,322 |
| Eastern ...  | 9,927  | 8,966   | 8,439   | 8,730   | 12,500  |
| Northern     | 1,864  | 2,191   | 2,834   | 1,244   | 2,212   |
| Tanga        |        | 364     | 1,814   | 2,275   | 2,245   |
| Southern ... | 247    | 258     | 128     | 38      | 50      |
| Western ...  | —      | —       | —       | —       | 732     |
|              | 50,638 | 102,638 | 122,058 | 133,591 | 169,061 |

## CASHEW NUTS

## Tons of nuts sold through local markets

| Province     | 1953   | 1954   | 1955   | 1956   | 1957   |
|--------------|--------|--------|--------|--------|--------|
| Southern ... | 8,768  | 11,500 | 13,233 | 14,363 | 20,500 |
| Eastern ...  | 1,297  | 1,658  | 1,799  | 2,284  | 2,900  |
|              | 10,065 | 13,158 | 15,032 | 16,647 | 23,400 |

## CASSAVA

## Tons sold through local markets

| Province     | 1953          | 1954         | 1955          | 1956          | 1957          |
|--------------|---------------|--------------|---------------|---------------|---------------|
| Southern ... | 8,044         | 4,297        | 8,786         | 21,387        | 19,600        |
| Eastern ...  | 236           | 487          | 245           | 337           | 100           |
| Central ...  | 606           | 20           | 18            | —             | —             |
| Western ...  | 3,423         | 4,243        | 5,935         | 9,648         | 4,600         |
| Lake ...     | —             | 37           | 10            | 100           | 1,100         |
|              | <u>12,309</u> | <u>9,084</u> | <u>14,994</u> | <u>31,472</u> | <u>25,400</u> |

## COCONUTS

## Tons of Copra

| Province     | 1953          | 1954          | 1955          | 1956         | 1957         |
|--------------|---------------|---------------|---------------|--------------|--------------|
| Southern ... | 419           | 495           | 552           | 852          | 800          |
| Tanga ...    | 5,821         | 4,794         | 5,486         | 4,607        | 3,500        |
| Eastern ...  | 5,856         | 7,299         | 4,955         | 4,204        | 4,000        |
|              | <u>12,096</u> | <u>12,588</u> | <u>10,993</u> | <u>9,663</u> | <u>8,300</u> |

## MAIZE

| Province               | 1954          | 1955           | 1956          | 1957          |
|------------------------|---------------|----------------|---------------|---------------|
| Southern Highlands ... | 13,399        | 25,766         | 7,250         | 5,200         |
| Northern ...           | 17,173        | 36,041         | 26,000        | 20,000        |
| Southern ...           | 4,550         | 2,670          | 3,990         | 5,500         |
| Western ...            | 10,032        | 17,864         | 7,615         | 7,800         |
| Eastern ...            | 6,271         | 20,069         | 6,560         | 7,300         |
| Central ...            | 562           | 3,322          | 2,650         | 600           |
| Tanga ...              | 1,050         | 9,118          | 2,248         | 1,000         |
| Lake ...               | 4,429         | 5,740          | 3,687         | 4,300         |
|                        | <u>57,466</u> | <u>120,590</u> | <u>60,000</u> | <u>51,700</u> |

NOTE:—The figures for 1954 and 1955 are the actual tonnages delivered to Grain Storage Department when control was in force. The figures from 1956 are the tonnage sold through normal channels. The figure for the Southern Province includes sales by Tanganyika Agricultural Corporation.

## OIL SEEDS

## (a) TONS SURPLUS COTTON SEED

|              | 1955          | 1956          | 1957          |
|--------------|---------------|---------------|---------------|
| Lake ...     | 33,000        | 36,000        | 41,500        |
| Eastern ...  | 2,000         | 2,800         | 3,900         |
| Northern ... | 400           | 500           | 500           |
| Tanga ...    | 600           | 300           | 400           |
|              | <u>36,000</u> | <u>39,600</u> | <u>46,300</u> |

## (b) GROUNDNUTS

## Tons sold through local markets

| Province               | 1953         | 1954         | 1955         | 1956          | 1957          |
|------------------------|--------------|--------------|--------------|---------------|---------------|
| Lake ...               | 20           | 843          | 827          | 2,081         | 2,500         |
| Central ...            | 388          | 654          | 550          | 2,096         | 2,700         |
| Western ...            | 389          | 1,131        | 3,122        | 6,035         | 5,500         |
| Southern ...           | 406          | 1,480        | 3,985        | 4,158         | 3,200         |
| Eastern ...            | —            | —            | —            | (a)           | 700           |
| Southern Highlands ... | —            | —            | 79           | 79            | 200           |
| Northern ...           | —            | —            | —            | 211           | 500           |
|                        | <u>1,183</u> | <u>4,108</u> | <u>8,563</u> | <u>14,660</u> | <u>15,300</u> |

(a) Includes sales by Tanganyika Agricultural Corporation

## (c) SESAME

## Tons sold through local markets

| <i>Province</i> | 1953         | 1954         | 1955         | 1956         | 1957         |
|-----------------|--------------|--------------|--------------|--------------|--------------|
| Southern... ..  | 1,286        | 2,490        | 4,138        | 6,176        | 5,900        |
| Eastern ... ..  | 229          | 184          | 299          | 558          | 400          |
| Lake ... ..     | 3            | 33           | 36           | 65           | 100          |
| Central ... ..  | —            | —            | 43           | 50           | 50           |
| Western ... ..  | —            | —            | —            | 45           | 50           |
|                 | <u>1,518</u> | <u>2,707</u> | <u>4,516</u> | <u>6,894</u> | <u>6,500</u> |

## (d) SUNFLOWER

## Tons of seed sold through local markets

| <i>Province</i>        | 1953         | 1954         | 1955          | 1956         | 1957          |
|------------------------|--------------|--------------|---------------|--------------|---------------|
| Southern Highlands ... | 160          | 355          | 289           | 701          | 1,000         |
| Central ... ..         | 80           | 155          | 104           | 356          | 400           |
| Western ... ..         | 446          | 1,512        | 5,311         | 3,482        | 4,000         |
| Eastern ... ..         | 568          | 658          | 603           | 1,326        | 2,600         |
|                        |              |              |               | (a)          |               |
| Northern ... ..        | 420          | 594          | 968           | 451          | 1,100         |
| Southern... ..         | 176          | 508          | 539           | 738          | 2,500         |
| Lake ... ..            | 316          | 677          | 2,423         | 886          | 1,000         |
| Tanga ... ..           | 216          | 93           | 109           | 17           | 50            |
|                        | <u>2,382</u> | <u>4,552</u> | <u>10,346</u> | <u>7,957</u> | <u>12,650</u> |

(a) Includes 400 tons estate production.

## PULSES

(including yellow peas, chickpea, soya, mixed beans, cowpea, gram, pigeon pea, bambarra nuts).

| <i>Province</i>        | 1953          | 1954          | 1955          | 1956          | 1957          |
|------------------------|---------------|---------------|---------------|---------------|---------------|
| Southern... ..         | 1,076         | 2,237         | 2,700         | 2,794         | 4,000         |
|                        |               |               |               | (a)           | (a) (b)       |
| Central ... ..         | 15            | 31            | 73            | 106           | 100           |
| Western ... ..         | 867           | 1,754         | 2,680         | 1,892         | 1,800         |
| Lake ... ..            | 4,137         | 6,890         | 4,472         | 2,299         | 3,500         |
| Southern Highlands ... | 1,189         | 1,210         | 1,064         | 2,208         | 1,600         |
| Eastern ... ..         | 752           | 688           | 565           | 592           | 800           |
| Northern ... ..        | 4,297         | 4,022         | *1,398        | 4,147         | 1,600         |
| Tanga ... ..           | —             | —             | 618           | 276           | 800           |
|                        | <u>12,333</u> | <u>16,732</u> | <u>13,570</u> | <u>14,314</u> | <u>14,200</u> |

(\*excluding haricot beans, 1,358 tons)

(a) Includes sales by Tanganyika Agricultural Corporation.

(b) Includes 1,500 tons soya beans.

## PYRETHRUM

## Tons of dried flowers

| <i>Province</i>        | 1953       | 1954       | 1955       | 1956       | 1957       |
|------------------------|------------|------------|------------|------------|------------|
| Northern ... ..        | 125        | 360        | 379        | 479        | 446        |
| Southern Highlands ... | 150        | 175        | 234        | 261        | 291        |
|                        | <u>275</u> | <u>535</u> | <u>613</u> | <u>740</u> | <u>737</u> |



## RICE

## Tons of Paddy

| Province               | 1953          | 1954          | 1955          | 1956          | 1957          |
|------------------------|---------------|---------------|---------------|---------------|---------------|
| Eastern ... ..         | 6,657         | 9,841         | 14,172        | 2,319         | 8,300         |
| Central ... ..         | —             | —             | 48            | —             | —             |
| Southern Highlands ... | 5,769         | 6,890         | 6,042         | 2,709         | 5,100         |
| Southern ... ..        | 662           | 1,215         | 2,276         | 1,835         | 1,400         |
| Western ... ..         | 630           | 1,640         | 2,962         | 2,230         | 4,000         |
| Lake ... ..            | 1,300         | 4,620         | 3,712         | 2,781         | 6,000         |
| Northern ... ..        | 61            | 74            | 84            | 51            | 50            |
| Tanga ... ..           | 1,750         | 2,321         | 2,783         | 2,436         | 3,000         |
|                        | <u>16,629</u> | <u>16,601</u> | <u>32,059</u> | <u>14,361</u> | <u>27,850</u> |

## SEED BEANS

|                      | 1952/53 | 1953/54 | 1954/55 | 1955/56 | 1956/57 |
|----------------------|---------|---------|---------|---------|---------|
| Tons exported ... .. | 1,460   | 1,894   | 2,110   | 2,549   | 1,247   |

## TEA

## Manufactured tea in lb.

| Province               | 1953      | 1954      | 1955             | 1956             | 1957             |
|------------------------|-----------|-----------|------------------|------------------|------------------|
| Southern Highlands ... | 2,821,245 | 3,583,655 | 3,303,666        | 3,806,117        | 4,108,000        |
| Tanga ... }            |           |           | 1,217,449        | 1,633,093        | 2,241,000        |
| Total...               |           |           | <u>4,521,115</u> | <u>5,439,210</u> | <u>6,349,000</u> |

## TOBACCO

(a) *Flue-cured*

## Cured leaf in lb.

| Province           | 1953             | 1954             | 1955             | 1956             | 1957             |
|--------------------|------------------|------------------|------------------|------------------|------------------|
| Southern Highlands | 1,995,325        | 3,269,407        | 2,909,890        | 2,738,283        | 2,735,000        |
| Western ... ..     | 188,480          | 228,863          | 291,165          | 572,925          | 773,000          |
| Southern ... ..    | 22,400           | 73,920           | 185,920          | 112,000          | 134,000          |
| Lake ... ..        | —                | —                | —                | —                | 2,000            |
|                    | <u>2,206,205</u> | <u>3,572,190</u> | <u>3,386,975</u> | <u>3,423,208</u> | <u>3,644,000</u> |

(b) *Fire-cured*

## Cured leaf in lb.

| Area              | 1953           | 1954             | 1955             | 1956             | 1957             |
|-------------------|----------------|------------------|------------------|------------------|------------------|
| Songea ... ..     | 542,080        | 1,516,489        | 982,240          | 647,535          | 598,000          |
| Nyamirembe ... .. | 309,120        | 400,960          | 361,312          | 545,720          | 473,000          |
|                   | <u>851,200</u> | <u>1,917,440</u> | <u>1,343,582</u> | <u>1,193,255</u> | <u>1,071,000</u> |

## WATTLE

| Province               | 1955<br>Production<br>(tons) | 1956<br>Production<br>(tons) | 1957<br>Production<br>(tons) |
|------------------------|------------------------------|------------------------------|------------------------------|
| Southern Highlands ... | 180                          | 370                          | 150                          |
| Eastern ... ..         | —                            | —                            | 50                           |
| Northern ... ..        | 295                          | 300                          | 300                          |
| Tanga ... ..           | 4,154                        | 2,250                        | 1,050                        |
|                        | <u>4,629</u>                 | <u>2,920</u>                 | <u>1,550</u>                 |

## WHEAT

Tons sold through organized markets

| Province               | 1953         | 1954         | 1955         | 1956         | 1957         |
|------------------------|--------------|--------------|--------------|--------------|--------------|
| Northern ...           | 4,301        | 9,320        | 3,722        | 4,237        | 3,300        |
| Southern Highlands ... | 66           | 100          | 80           | 97           | 200          |
| Southern... ..         | 600          | 350          | 303          | 368          | 300          |
| Western ...            | 7            | -            | 28           | 68           | 50           |
| Eastern ...            | -            | -            | 51           | -            | 50           |
|                        | <u>4,924</u> | <u>9,770</u> | <u>4,183</u> | <u>4,770</u> | <u>3,900</u> |

## MINOR CROPS

ONIONS, in tons

| Province               | 1953         | 1954         | 1955         | 1956         | 1957         |
|------------------------|--------------|--------------|--------------|--------------|--------------|
| Northern ...           | 1,460        | 1,603        | 2,297        | 3,911        | 2,580        |
| Eastern ...            | 157          | 70           | 61           | 150          | 140          |
| Central ...            | 200          | 317          | 160          | 272          | 300          |
| Lake ...               | -            | 250          | 8            | 25           | 10           |
| Western ...            | -            | -            | 17           | 21           | 20           |
| Southern... ..         | -            | -            | 16           | 22           | 10           |
| Southern Highlands ... | -            | -            | 195          | 201          | 210          |
| Tanga ...              | -            | -            | -            | 53           | 40           |
|                        | <u>1,817</u> | <u>2,240</u> | <u>2,754</u> | <u>4,655</u> | <u>3,310</u> |

## GUMS

(Arabic and Copal) in tons

| Province       | 1953       | 1954       | 1955       | 1956       | 1957       |
|----------------|------------|------------|------------|------------|------------|
| Central ...    | 97         | 193        | 157        | 175        | 100        |
| Western ...    | 375        | 397        | 426        | 285        | 150        |
| Lake ...       | 232        | 256        | 402        | 158        | 150        |
| Southern... .. | -          | -          | -          | -          | 50         |
|                | <u>602</u> | <u>846</u> | <u>985</u> | <u>618</u> | <u>450</u> |

## KAPOK

(in tons)

| Province       | 1953       | 1954       | 1955       | 1956         | 1957         |
|----------------|------------|------------|------------|--------------|--------------|
| Tanga ...      | 320        | 110        | 337        | 415          | 400          |
| Eastern ...    | 420        | 424        | 216        | 941          | 1,200        |
| Southern... .. | -          | 45         | 62         | 44           | 50           |
|                | <u>740</u> | <u>579</u> | <u>615</u> | <u>1,400</u> | <u>1,650</u> |

## OIL PALM

(a) Palm oil in tons

| Province    | 1953      | 1954       | 1955       | 1956      | 1957      |
|-------------|-----------|------------|------------|-----------|-----------|
| Western ... | } 64      | 110        | 83         | 47        | 50        |
| Tanga ...   |           | 35         | 40         | 40        | 30        |
|             | <u>64</u> | <u>145</u> | <u>123</u> | <u>87</u> | <u>80</u> |

(b) Kernels in tons

| Province    | 1953       | 1954       | 1955       | 1956       | 1957       |
|-------------|------------|------------|------------|------------|------------|
| Western ... | } 499      | 488        | 370        | 351        | 350        |
| Tanga ...   |            | 24         | 30         | 30         | 20         |
|             | <u>499</u> | <u>512</u> | <u>400</u> | <u>381</u> | <u>370</u> |

## EXPORTS FROM TANGANYIKA OF AGRICULTURAL PRODUCTS, 1953-1957

|                          | Maximum Export<br>prior to 1957 |         | 1953<br>Amount | 1954<br>Amount | 1955<br>Amount | 1956<br>Amount | 1957<br>Amount | Export<br>value, 1957 |
|--------------------------|---------------------------------|---------|----------------|----------------|----------------|----------------|----------------|-----------------------|
|                          | Year                            | Tons    |                |                |                |                |                |                       |
| Sisal ...                | 1956                            | 185,588 | 171,151        | 167,642        | 173,676        | 185,588        | 181,815        | 9,481,514             |
| Cotton lint ...          | 1956                            | 27,890  | 14,749         | 12,111         | 20,374         | 27,890         | 27,210         | 6,577,765             |
| Cotton seed ...          | —                               | —       | —              | —              | —              | —              | 8,386          | 202,464               |
| Cotton seed oil ...      | —                               | —       | —              | —              | —              | —              | 1,981          | 222,521               |
| Coffee ...               | 1956                            | 21,625  | 15,239         | 19,382         | 18,499         | 21,625         | 18,481         | 7,141,682             |
| Barley ...               | 1955                            | 452     | —              | 293            | 452            | —              | —              | —                     |
| Beans and Pulses ...     | 1952                            | 23,184  | 10,551         | 10,432         | 8,279          | 9,413          | 5,368          | 327,212               |
| Beans, Soya ...          | 1956                            | 913     | 674            | 522            | 567            | 913            | 1,483          | 69,557                |
| Cashew nuts ...          | 1955                            | 18,202  | 11,358         | 16,298         | 18,202         | 16,741         | 33,651         | 1,513,507             |
| Castor seed ...          | 1952                            | 12,345  | 11,754         | 9,609          | 7,870          | 12,012         | 13,894         | 860,069               |
| Cassava ...              | 1956                            | 24,000  | 561            | 1,714          | 2,486          | 24,000         | 20,051         | 353,668               |
| Copra ...                | 1928                            | 9,318   | 1,083          | 2,046          | 4,723          | 3,788          | 236            | 14,015                |
| Fats ...                 | 1948                            | 1,689   | 69             | 91             | 83             | 64             | 66             | 4,355                 |
| Gum Arabic ...           | 1930                            | 2,319   | 1,346          | 1,534          | 2,125          | 1,542          | 684            | 77,915                |
| Gum Copal ...            | 1950                            | 110     | 38             | 58             | 70             | 45             | 40             | 2,583                 |
| Groundnuts ...           | 1936                            | 22,786  | 1,088          | 2,503          | 5,586          | 15,143         | 16,090         | 1,072,924             |
| Kapok ...                | 1955                            | 872     | 838            | 581            | 872            | 717            | 905            | 179,171               |
| Maize ...                | 1956                            | 106,363 | 234            | —              | 35,835         | 106,363        | 9,071          | 174,897               |
| Miller and Sorghum ...   | 1955                            | 13,150  | 1,958          | 17             | 13,150         | 5,084          | 899            | 20,116                |
| Onions ...               | 1948                            | 2,418   | 187            | 872            | 151            | 90             | 171            | 7,168                 |
| Palm kernels ...         | 1954                            | 674     | 578            | 674            | 386            | 472            | 454            | 18,975                |
| Papain ...               | 1948                            | 130     | 83             | 103            | 37             | 17             | 23             | 67,318                |
| Pyrethrum ...            | 1945                            | 697     | 155            | 136            | 275            | 307            | 292            | 83,416                |
| Rice ...                 | 1938                            | 17,965  | 3              | 72             | 1,247          | 1,704          | 1,853          | 94,017                |
| Rubber ...               | 1944                            | 1,314   | —              | —              | —              | —              | —              | —                     |
| Sesame ...               | 1956                            | 10,628  | 343            | 3,108          | 4,207          | 10,628         | 8,180          | 529,995               |
| Sugar ...                | 1941                            | 5,454   | 1              | 2              | —              | 33             | 175            | 128                   |
| Sunflower seed ...       | 1952                            | 17,708  | 6,180          | 10,202         | 12,506         | 14,729         | 19,626         | 597,793               |
| Tea ...                  | 1956                            | 1,979   | 1,122          | 1,566          | 1,689          | 1,979          | 2,176          | 601,050               |
| Tobacco ...              | 1948                            | 1,421   | 333            | 350            | 448            | 135            | 342            | 74,301                |
| Other Vegetable Oils ... | 1940                            | 2,268   | 1,063          | 723            | 61             | 1,468          | 57             | 7,914                 |
| Wattle bark ...          | 1955                            | 4,837   | 2,009          | 2,122          | 4,837          | 3,178          | 1,525          | 34,360                |
| Wheat ...                | 1945                            | 4,511   | —              | 10             | —              | —              | —              | —                     |
| Essential Oils ...       | 1950                            | 9       | 3              | 2              | 3              | 4              | 4              | 9,534                 |
| Total ...                | —                               | —       | 254,751        | 264,775        | 338,696        | 465,672        | 375,189        | £30,421,904           |



